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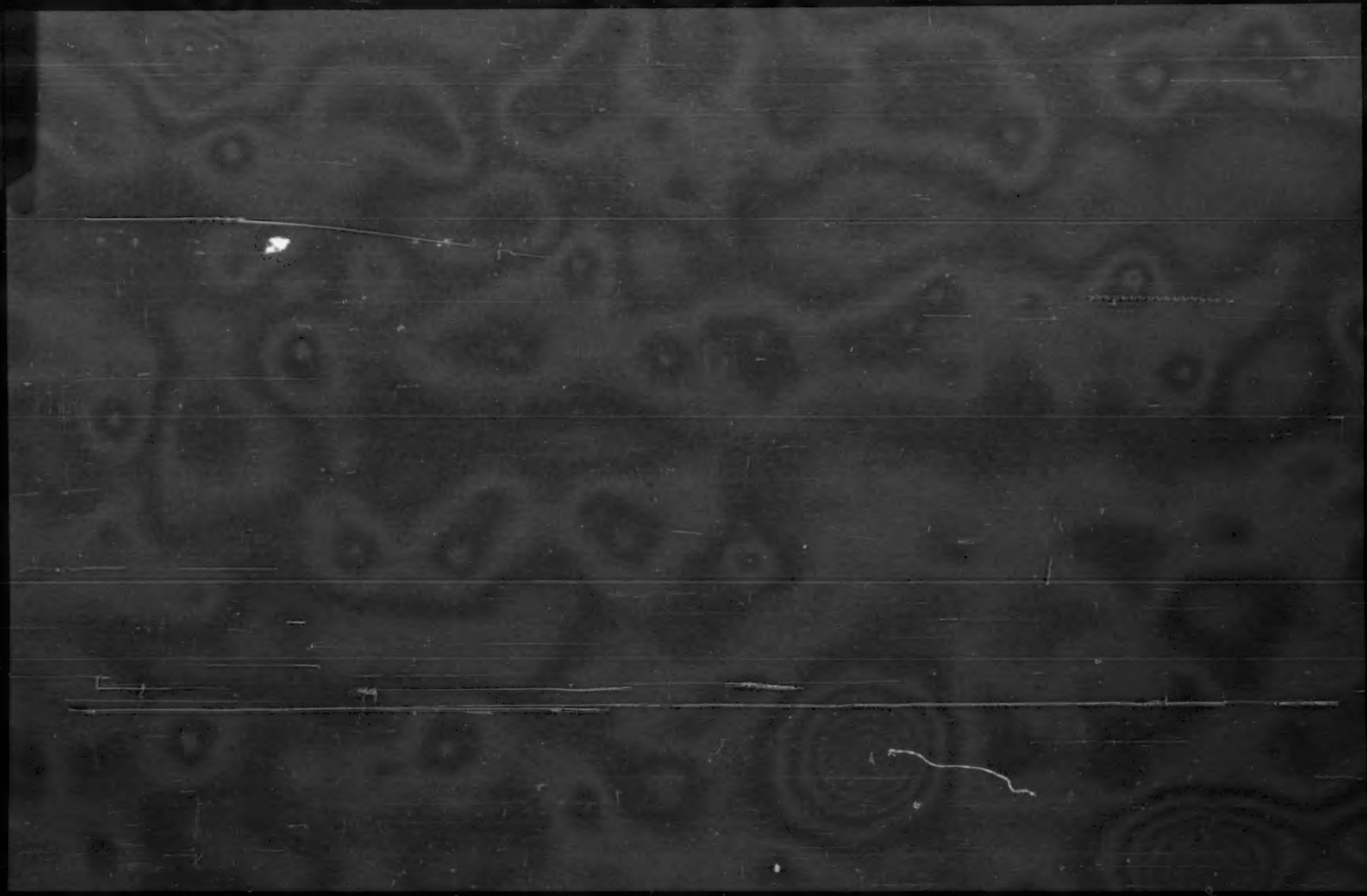

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# SOCIAL COMPETENCE AND THE PROCESS–REACTIVE DISTINCTION IN PSYCHOPATHOLOGY[1]

EDWARD ZIGLER AND LESLIE PHILLIPS

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The psychiatric category of schizophrenia encompasses a highly heterogeneous group of patients who vary widely in genetic background, physiological and biochemical processes, psychological characteristics, patterns of social interaction, and symptoms manifested. In view of this heterogeneity, a number of investigators have expressed the need for a more articulated taxonomy of schizophrenia (Bellak, 1948; Bleuler, 1950; Freudenberg & Robertson, 1956; King, 1954; Thorne, 1953; Weiner, 1958; Wittenborn, Holzberg, & Simon, 1953; Zigler & Phillips, 1961b, 1961c). While a number of efforts at further differentiation of schizophrenia have been made (Weiner, 1958) the process-reactive distinction appears to have received the widest currency in the psychiatric literature (Becker, 1956, 1959; Garmezy & Rodnick, 1959; Kantor, Wallner, & Winder, 1953; Kantor & Winder, 1959; King, 1954; Kretschmer, 1925; Langfeldt, 1937; Mauz, 1930; Weiner, 1958; Zimet & Fine, 1959). Lewis (1936) has suggested that this bifurcation of the schizophrenic syndrome provides the most promising direction for future research into this disorder.

Although the definitions of process and reactive schizophrenia differ slightly with individual investigators, the factors of premorbid social adequacy, nature of onset, and outcome have been commonly employed to differentiate the two types. The classic process schizophrenic displays a complex of poor premorbid social adequacy, an insidious onset with no indication of a clear precipitating factor, and a poor prognosis. Antithetically, the reactive schizophrenic is characterized by a relatively good level of premorbid social adequacy, a sudden onset with a specific event precipitating the disorder, and a more favorable prognosis.

Frequently associated with the process-reactive dichotomy is the assumption that process schizophrenia mirrors an organic etiology while reactive schizophrenia is functional in nature (Brackbill, 1956; Brackbill & Fine, 1956; Hoskins, 1946; Kretschmer, 1925; Langfeldt, 1937; Mauz, 1930; Zimet & Fine, 1959). Despite the failure to find a fundamental biochemical or physiological deviation associated with schizophrenia (Kety, 1959a, 1959b, 1959c) this disorder has persistently been viewed as dichotomous, influenced alternatively by either somatic or by psychological factors. The reasons for the persistence of this view have been outlined at some length by Garmezy and Rodnick (1959). Nevertheless, a number of investigators (Becker, 1956, 1959; Garmezy & Rodnick, 1959; Kantor et al., 1953; Kantor & Winder, 1959) have taken exception to the proposition that the process-reactive distinction reflects a true dichotomy, suggesting instead that it should be conceptualized as a continuum with classic process and reactive schizophrenia representing its end points. However, it should be noted that the latter view in itself does not negate any of the etiological possibilities, i.e., that the etiology of schizophrenia is purely organic, purely functional, or is due to some combination of these two factors.

The question of whether the symptoms manifested in the acute phase by the process schizophrenic differs from those of the reactive schizophrenic has remained ambiguous. Considerable disagreement exists between investigators who have variously suggested that a difference exists between the two types in the incidence of such symptoms as massive hallucinatory experience; ideas of reference; mild paranoid trends; cloudy sen-

[1] This investigation was supported by the Dementia Praecox Research Project, Worcester State Hospital, and a research grant (M-896) from the National Institute of Mental Health, United States Public Health Service.

sorium; thought disorder; dull, rigid, or inappropriate affect; tension; confusion; somatic delusions; loss of decency; etc. (Becker, 1956; Eitinger, Laane, & Langfeldt, 1958; Garmezy & Rodnick, 1959; Kantor et al., 1953; Kantor & Winder, 1959; Langfeldt, 1937; Weiner, 1958). Even Langfeldt, who has been the most adamant in the view that process schizophrenia could be differentiated from reactive schizophrenia (schizophreniform psychosis) on the basis of presenting symptoms, finally took the position that the distinction between the two types must ultimately be made on the basis of premorbid personality, onset of illness, and other factors extraneous to the presenting symptomatology (Eitinger et al., 1958). Thus, the predominant view now appears to be that while there is little or no difference in the gross psychiatric symptomatology of process and reactives certain perceptual and cognitive differences may be teased out by employing projective techniques (Becker, 1956; Finkelstein, 1953; Kantor et al., 1953; Zimet & Fine, 1959).

In regard to differences in the symptom picture in the two types of schizophrenia, it should be noted that the categorizing principle for the process and reactive categories is quite different from that employed for the conventional subclasses of schizophrenia, e.g., simple, paranoid, etc. In the conventional subclasses, categorization is almost solely a function of differences in the symptoms manifested. In contrast, the process-reactive distinction has rested almost entirely on variables other than those occurring in the acute phase of the disorder, i.e., those occurring in either the pre- or postmorbid phases. Had gross differences in the symptom pictures of process and reactive schizophrenics been noted, these categories probably would have evolved as conventional subclasses rather than as superordinate categories employing a unique classificatory principle which cuts across the existing subgroups of schizophrenia.

It becomes apparent that implicit in the process-reactive distinction is the view that individuals who vary greatly on certain significant psychological dimensions, e.g., premorbid adequacy, potential for recovery, etc., regress during the acute phase to a common low level of functioning during which symptomatic behaviors are unrelated to such dimensions. Such a view is contrary to the developmental approach to psychopathology which asserts that mental disorders represent a continuous process in which the premorbid, initial, middle, and ultimate stages are meaningfully interrelated (Phillips, 1960a, 1960b; Phillips & Rabinovitch, 1958; Phillips & Zigler, 1961; Zigler & Phillips, 1960, 1961a). Furthermore, the developmental position maintains that the relationship of achieved level of maturity (defined in terms of premorbid social competence) to certain dimensions of psychopathology is not unique to schizophrenia, but instead cuts across all forms of functional mental disorder. Major support for this position comes from the finding that an identical relationship between social competence and prognosis obtains in both a schizophrenic and a nonschizophrenic hospital population (Zigler & Phillips, 1961d). Further support for the developmental position may be derived from recent studies of process and reactive schizophrenics that reported a relationship between these two types of schizophrenia and general level of maturity as measured by developmental Rorschach indices (Becker, 1956; Zimet & Fine, 1959), as well as from a study in which a relationship was found between length of hospitalization and these same perceptual indices in a population including both schizophrenic and nonschizophrenic psychotics (Levine, 1959). These findings suggest that process and reactive schizophrenics may be viewed as falling at different points on a developmental continuum. Since such developmental differences have been found to be related to the functioning of normal and deviant children, adolescents, normal adults, neurotics, character disorders, and both schizophrenic and nonschizophrenic psychotics (Grace, 1956; Hurwitz, 1954; Lane, 1955; Levine, 1959; Phillips & Zigler, 1961; Smith & Phillips, 1959; Zigler & Phillips, 1960), it would appear questionable to assert that the significance of this developmental dimension is unique to the schizophrenic syndrome.

It thus becomes apparent that while certain of the major features of the process-reactive distinction are congruent with the developmental view of psychopathology, other aspects

of this distinction are inimical to the developmental position. First, these forms of schizophrenia are conceptualized as inherently dichotomous in nature, whereas their correspondence to the maturational variable of social competence would suggest that they are continuous in nature. Second, the assumption of a process-reactive framework assumes that the defining characteristics of these syndromes are unique to schizophrenia, whereas the developmental position would suggest that these are maintained for all the functional mental disorders. Finally, the orthodox process-reactive position maintains that individuals who differ widely on an often employed measure of developmental level, i.e., premorbid social competence, nevertheless display similar symptom pictures. In contrast, Zigler and Phillips (1960) found that individuals who had achieved higher levels of premorbid social competence were more likely to show symptoms indicative of a "turning against the self," whereas individuals of lower levels of social competence typically expressed in their deviant behaviors an "avoidance of others" or a "turning against others."

A major purpose of the present study is to test directly the developmental position concerning the relationship between developmental level and symptom manifestations. The specific hypothesis is advanced that within a schizophrenic population the symptom pattern of individuals who have exhibited a relatively good level of premorbid social competence will be characterized by a "turning against the self," whereas the symptom pattern of individuals who have exhibited poor premorbid social competence will be characterized by either an "avoidance of others" or "self-indulgence and turning against others." A second hypothesis, to be tested in the present study, is that this relationship between premorbid social competence and symptomatology is not unique to schizophrenia, but instead also obtains in the nonschizophrenic portion of a pathological population. Finally, we shall examine the feasibility of treating social competence in these relationships as a continuous variable, as a more appropriate alternative to the process-reactive dichotomy.

## METHOD

*Subjects.* The study was based on the examination of the case histories of 806 patients referred during a 13-year period (1945–1958) for personality study, to the Psychology Department, Worcester State Hospital. The particular case histories employed were those of patients who were eventually diagnosed as suffering from a functional disorder.

*Diagnosis.* The diagnosis ascribed to each patient in the study was that psychiatric classification agreed upon at a diagnostic staff conference and noted on the patient's hospital record as his primary diagnosis. The diagnostic classification of mental illness used by Worcester State Hospital during this period was based on the following sources: *Standard Classified Nomenclature of Disease* (1945–1952) and *Diagnostic and Statistical Manual of Mental Disorders* (1953–1958).

The patients in the present study were categorized into four major diagnostic groups: Schizophrenic, manic-depressive, psychoneurotic, and character disorders. The composition of each of these groups was as follows:

1. The schizophrenic population included those with diagnoses of the following types of schizophrenic reactions: simple, hebephrenic, catatonic, paranoid, undifferentiated, and schizo-affective ($N = 298$).

2. Manic-depressive here was defined to include the diagnoses of involutional psychotic reaction; manic-depressive, manic; manic-depressive, depressive; manic-depressive, other; and, psychotic depressive reaction ($N = 74$).

3. Psychoneurotic included diagnoses of the following types of psychoneurotic reactions: anxiety, dissociative, conversion, phobic, obsessive-compulsive, depressive, and other ($N = 159$).

4. Character disorder included the diagnoses of personality pattern disturbance: inadequate, schizoid, cyclothymic, or paranoid type; personality trait disturbance: emotionally unstable, passive-aggressive, compulsive personality, or other type; and, sociopathic disturbances of the following types: antisocial; dissocial; sexual deviation; addiction, alcoholism; and, addiction, drug addiction ($N = 275$).

*Premorbid social competence scores.* The variables of age, intelligence, education, occupation, employment history, and marital status were used as social competence indices. Each variable was divided into three categories with each category conceptualized as representing a step along a social competence continuum. The rationale employed for ordering the categories of each variable was presented in an earlier study (Zigler & Phillips, 1961a). The categories of each variable and their order from low to high are presented below:

1. Age: 24 and below; 25–44; and, 45 years and above.

2. Intelligence: IQs obtained on a standard intelligence test of 84 or less; 85–115; and, 116 and above.

3. Education: none or some grades including ungraded or special classes; finished grade school,

some high school, or finished high school; and, some college or more.

4. Occupation: *The Dictionary of Occupational Titles* (United States Government Printing Office, 1949) was employed to place each occupation into the categories of unskilled or semiskilled, skilled and service, or, clerical and sales, or professional and managerial. Individuals who did not clearly fall into one of these categories, e.g., housewives, were not given a score on this variable.

5. Employment history: usually unemployed; seasonal, fluctuating, frequent shifts, or part-time employment; and, regularly employed.

6. Marital status: single; separated, divorced, remarried, or widowed; and, single continuous marriage.

The case history of each individual was examined in order to assign him a score on each of the six social competence indices. For any of the indices, placement in the lowest category resulted in being given a score of 0 for that index. Similarly, assignment to the middle category resulted in a score of 1, and to the highest category a score of 2. The overall social competence score for each person was the mean of the scores obtained on the individual indices. This averaging procedure was required since data were not available for every individual on all six variables. Thus, the final social competence score for any patient could range from 0, i.e., he fell into the lowest category on every variable for which information was available, to 2, i.e., he fell into the highest category on every variable for which information was available.

*Categorization of symptoms.* A symptom in the present study, as in earlier studies (Phillips & Rabinovitch, 1958; Phillips & Zigler, 1961; Zigler & Phillips, 1961c), refers to the description of a patient's behavior by a psychiatrist at the time of initial institutional contact, or the description of behavior presented by referring physicians as the primary reason for hospitalization. Examination of the 806 case records resulted in the tabulation of 47 discrete presenting symptoms, 43 of which could be placed into the three symptom categories. The findings utilized to construct the categories and the rationale employed to include symptoms within these categories were presented in earlier studies (Phillips & Rabinovitch, 1958; Zigler & Phillips, 1961c). The three categories and the symptoms included in each are presented below:

1. Self-deprivation and turning against the self: suicidal attempt, suicidal ideas, euphoria, doesn't eat, bodily complaints, tense, headaches, self-depreciatory, depressed, fears own hostile impulses, mood swings, compulsions, insomnia, phobias, obsessions, feelings of sexual inadequacy, psychosomatic disorders.

2. Self-indulgence and turning against others: maniacal outbursts, perversions (except homosexuality), drinking, rape, robbery, irresponsible behavior, assaultive, threatens assault, emotional outbursts, homosexuality, lying, fire setting, disturbed-destructive, eats a lot, all addictions (except drinking), accused of murder.

3. Avoidance of others: withdrawn, feels perverted, suspicious, hallucinations, bizarre ideas, sexual preoccupation, apathetic, perplexed, depersonalization, feels going crazy.

The four symptoms not employed in the present study were amnesia, convulsions, tics, and blackouts. The occurrence of these symptoms is extremely rare in our total sample with not one of them occurring in more than 10 of the cases.

*Symptom scores.* A symptom score was devised that would reflect the relative dominance within an individual's symptom pattern of symptoms within the "turning against the self" category as opposed to the dominance of symptoms falling within the other two categories.

The symptom score for each individual was obtained by dividing the number of symptoms manifested by that individual that fell within the "turning against the self" category by the total number of symptoms he manifested. (In calculating the symptom scores, the four symptoms not included in any of the three symptom categories were ignored.) Thus, the individual who had symptoms only in the "turning against the self" category would receive a score of 1.00, the individual who had no symptoms in this category would receive a score of .00; the individual who had three symptoms in this category and three symptoms divided between the other two categories would receive a score of .50, etc.

## RESULTS AND DISCUSSION

The first hypothesis to be tested was that within a schizophrenic population the symptom pattern of individuals who have exhibited a relatively good level of premorbid social competence will be characterized by a "turning against the self," whereas the symptom pattern of individuals who have exhibited poor premorbid social competence will be characterized by either an "avoidance of others" or "self-indulgence and turning against others." In terms of the social competence and symptom scores, described above, the specific prediction would be that individuals attaining high social competence scores would also attain high symptom scores. The distribution of scores obtained by schizophrenics on both the social competence and symptom measures were divided at the 33rd and 66th percentile, thus forming High, Medium, and Low social competence categories and High, Medium, and Low symptom score categories (see Table 1). Following this a $3 \times 3$ Social Competence $\times$ Symptom Score contingency table was set up. The chi square test of independence was employed to deter-

TABLE 1

DISTRIBUTION OF SYMPTOM SCORES FOR THREE LEVELS OF SOCIAL COMPETENCE IN THE SCHIZOPHRENIC GROUP

| Symptom scores | Social competence scores | | | | | |
|---|---|---|---|---|---|---|
| | 1.20–2.00 | | .75–1.19 | | .00–.74 | |
| | Expected frequency | Observed frequency | Expected frequency | Observed frequency | Expected frequency | Observed frequency |
| .41–1.00 | 32.5 | 45.0 | 31.5 | 21.0 | 36.9 | 35.0 |
| .21–.40 | 27.7 | 22.0 | 26.8 | 37.0 | 31.5 | 27.0 |
| .00–.20 | 35.8 | 29.0 | 41.5 | 35.0 | 40.6 | 47.0 |

mine whether membership in a particular symptom score category was independent of membership in a particular social competence category. The resulting chi square was a significant one ($\chi^2 = 17.34$, $df = 4$, $p < .005$) and confirmed the prediction made. Individuals having high social competence scores also tended to have high symptom scores, while individuals having low social competence scores tended to have low symptom scores.

Thus, contrary to popular belief, differences do exist in the gross symptomatic pictures presented by process and reactive schizophrenics. The symptomatology of the reactive is more frequently characterized by a "turning against the self" than is that of the process schizophrenic. Since symptoms in this category are of a developmentally higher nature than symptoms in the other two categories (Phillips & Rabinovitch, 1958; Zigler & Phillips, 1960), this relationship is consistent with the view that an individual's developmental level is reflected in both his normal and abnormal functioning. It further suggests that in its acute phase schizophrenia does not represent an equally severe regression to a common low level of behavior.

The second prediction to be tested was that this relationship between social competence and symptom scores would also obtain in the nonschizophrenic portion of the sample. A second $3 \times 3$ Social Competence $\times$ Symptom Score contingency table was set up for all individuals who had received a diagnosis other than schizophrenia ($N = 508$). In order to make this table as comparable as possible to that constructed for schizophrenics, the same social competence and symptom score values were employed as the dividing points for the establishment of High, Medium, and Low groups on both variables. The chi square resulting from this table was also significant ($\chi^2 = 50.98$, $df = 4$, $p < .001$), with the relationship between the symptom score and social competence variables again being positive (see Table 2).

Here again the symptomatology of patients with relatively good premorbid histories is more characterized by symptoms in the "turning against the self" category than is the

TABLE 2

DISTRIBUTION OF SYMPTOM SCORES FOR THREE LEVELS OF SOCIAL COMPETENCE IN THE NONSCHIZOPHRENIC GROUP

| Symptom scores | Social competence scores | | | | | |
|---|---|---|---|---|---|---|
| | 1.20–2.00 | | .75–1.19 | | .00–.74 | |
| | Expected frequency | Observed frequency | Expected frequency | Observed frequency | Expected frequency | Observed frequency |
| .41–1.00 | 87.1 | 107.0 | 109.9 | 124.0 | 78.0 | 44.0 |
| .21–.40 | 24.1 | 24.0 | 30.4 | 19.0 | 21.5 | 33.0 |
| .00–.20 | 49.8 | 30.0 | 62.7 | 60.0 | 44.5 | 67.0 |

TABLE 3

DISTRIBUTION OF SOCIAL COMPETENCE SCORES IN THE SCHIZOPHRENIC AND NONSCHIZOPHRENIC PATIENT GROUPS

| Patient groups | Social competence scores | | | | | |
|---|---|---|---|---|---|---|
| | 1.20–2.00 | | .75–1.19 | | .00–.74 | |
| | Expected frequency | Observed frequency | Expected frequency | Observed frequency | Expected frequency | Observed frequency |
| Schizophrenic | 95.0 | 96.0 | 109.5 | 93.0 | 93.5 | 109.0 |
| Nonschizophrenic | 162.0 | 161.0 | 186.6 | 203.0 | 159.4 | 144.0 |

symptomatology of patients with poor premorbid histories. While the nonschizophrenic patients tend to have both higher social competence scores ($\chi^2 = 8.00$, $df = 2$, $p < .02$) and higher symptom scores ($\chi^2 = 36.37$, $df = 2$, $p < .001$) than schizophrenic patients, nevertheless within each of these two types of patients the better the premorbid history, the more likely it is that the symptomatic picture will be colored by symptoms of the "turning against the self" type (see Tables 3 and 4).

This finding, in conjunction with the earlier finding that both schizophrenic and nonschizophrenic patients with high social competence scores have a better prognosis than those with low scores (Zigler & Phillips, 1961d), calls into question the heuristic value of the process-reactive distinction in schizophrenia. The implication here is that the process-reactive distinction is reducible to the social competence dimension, which is continuous in nature, and which is applicable not only to schizophrenia but to all of psychopathology. This approach makes of psychopathology a unitary phenomenon rather than a collection of discrete entities, each conceptualized in terms of unique dimensions and parameters. In such a schema the various disorders are viewed as inappropriate solutions to the problems of living at various levels of development. It is surprising that investigators who have related process schizophrenia to genetically lower levels of development and reactive schizophrenia to genetically higher levels (Becker, 1956; Kantor et al., 1953; Zimet & Fine, 1959) have not logically extended their thinking to all of psychopathology. Certainly the genetically low and high Rorschach indices on which they based their findings are found in patients having diagnoses other than schizophrenia. Such an extension does run headlong into a problem which has yet to be handled by the developmental approach. Although in general the conventional psychiatric categories are related to the level of social maturity attained (Zigler & Phillips, 1961a, 1961c) one finds patients with both high and low competence scores in each of the conventional diagnostic categories. This less than perfect relationship may simply reflect what has long been suspected, namely, that in terms of the meaningful correlates of the diagnostic categories, the conventional

TABLE 4

DISTRIBUTION OF SYMPTOM SCORES IN THE SCHIZOPHRENIC AND NONSCHIZOPHRENIC PATIENT GROUPS

| Patient groups | Symptom scores | | | | | |
|---|---|---|---|---|---|---|
| | .41–1.00 | | .21–.40 | | .00–.20 | |
| | Expected frequency | Observed frequency | Expected frequency | Observed frequency | Expected frequency | Observed frequency |
| Schizophrenic | 139.0 | 101.0 | 60.9 | 86.0 | 98.1 | 111.0 |
| Nonschizophrenic | 237.0 | 275.0 | 102.1 | 76.0 | 168.9 | 157.0 |

diagnostic system is a relatively sterile one. It further suggests that the ability to predict such factors as outcome could be enhanced through the construction of a new diagnostic system based on a combination of premorbid social competence measures and related symptom dimensions.

## SUMMARY

The defining characteristics of process and reactive schizophrenics were noted. Certain aspects of the process-reactive issue were found to be consistent with a developmental approach to psychopathology while other aspects were inimical to such an approach. A major issue of contention was whether schizophrenics who differ in level of premorbid social competence nevertheless manifest a quite similar symptomatic picture. The developmental view asserts that patients differing in premorbid social competence should manifest different symptomatology. The specific hypothesis was tested that within a schizophrenic population the symptom pattern of patients who have exhibited a relatively good level of premorbid social competence will be more characterized by a "turning against the self," whereas the symptom pattern of patients who have exhibited poor premorbid social competence will be more characterized by either an "avoidance of others" or "self-indulgence and turning against others." The second hypothesis tested was that this relationship between premorbid social competence and symptomatology is not unique to schizophrenia but would also obtain in the nonschizophrenic portion of the pathological population.

The case histories of 298 schizophrenic and 508 nonschizophrenic patients were examined. The variables of age, intelligence, education, occupation, employment history, and marital status were employed in assigning each individual a social competence score. A symptom score was devised that reflected the relative dominance of "turning against the self" symptoms in the total symptom picture of each patient. Both hypotheses were confirmed.

In the light of these and earlier findings the position was advanced that the process-reactive distinction was reducible to the social maturity dimension which in turn was applicable to all of psychopathology rather than to schizophrenia alone.

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# EVALUATIONAL REACTIONS TO ACCENTED ENGLISH SPEECH [1]

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In a recent article (Lambert, Hodgson, Gardner, & Fillenbaum, 1960), it was argued that "spoken language is an identifying feature of members of a national or cultural group and any listener's attitude toward members of a particular group should generalize to the language they use" (p. 44). The evaluational reactions to a spoken language therefore should be similar to reactions elicited in interaction with those perceived as members of a group that use it. But because the use of a particular language is a feature of all members of a national or cultural group, the reactions to the language per se should reflect mainly stereotyped characteristics of the group habitually using it.

These ideas were tested by having English Canadians listen to the recorded voices of English and French speakers and requesting that they indicate the personality traits of the speakers which came to mind as they heard each voice. The judges were kept ignorant of the fact that, for purposes of control, perfectly bilingual speakers were actually being heard, speaking one time with a flawless English guise and at another time in perfect French. The results indicated that the English guises were more favorably evaluated on a series of traits. When the same procedure was carried out with French Canadians acting as judges of the personalities, they not only evaluated the English guises more favorably than French guises, their evaluations of French guises were reliably less favorable than those of the English Canadian judges. Furthermore, there were essentially no relations between attitudes toward the other group and the evaluational reactions to the guises, permitting us to interpret the results as a reflection of the influence of community-wide stereotypes of English- and French-speaking Canadians.

The present study was designed to extend the implications of both the method and its underlying rationale to another cultural group which can be distinguished by its style of speech and about which many stereotypes are held, namely, Jews who speak English with a distinctive accent. Specifically, the study was undertaken to find out whether subjects will exhibit differential reactions to the same speaker when speaking in "pure" English and in English with a Jewish accent, and whether any differences will be evident between gentile and Jewish subjects in this regard.

## METHOD

### *Procedure*

Tape recordings of speakers reading a philosophical passage once in English (E) and a second time in English with a Jewish accent (EJ), were evaluated by a panel of judges who selected the four best. The criteria for selection were that the E guise sounded flawless in English expression and the EJ guise sounded genuinely Jewish and not caricatured. All four speakers were Jewish. The tape recordings of two practice voices (speaking nonaccented English) and the eight guises chosen by the panel were presented to mixed groups of Jewish and non-Jewish undergraduate students enrolled in second and third year psychology courses at McGill. The order of presentation of voices was: Practice I, Practice II, Aug (E), Wil (EJ), Ra (E), Co (E), Aug (EJ), Wil (E), Ra (EJ), Co (EJ).

The experiment was introduced as an attempt to determine how well one can evaluate personalities on the basis of voices alone. Subjects believed that objective measures of personality were available for the speakers and they were to be tested for their accuracy of evaluation against these standards. The subjects were not made aware of the matching design employed and there was no indication that any subject did not attribute the eight voices to eight different speakers.

The subjects rated each guise on 14 traits, along six-point scales ranging from very little (scored 1) to very much (scored 6). An example of a rating scale follows:

Height Very little —:—:—:—:—:— Very much

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TABLE 1

MEANS AND *t* VALUES FOR EVALUATIONS OF E AND EJ GUISES BY JEWISH SUBJECTS, CORRECT IDENTIFICATIONS

| Trait | Speakers | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Co ($df = 19$) | | | Ra ($df = 16$) | | | Wil ($df = 19$) | | | Aug ($df = 28$) | | | Overall | | |
| | *M* | | *t* | *M* | | *t* | *M* | | *t* | *M* | | *t* | *M* | | *t* |
| | E | EJ | | E | EJ | | E | EJ | | E | EJ | | E | EJ | |
| Height | 3.65 | 1.95 | 5.02* | 3.47 | 2.59 | 2.76* | 4.20 | 3.00 | 3.84* | 3.79 | 2.90 | 4.77* | 3.79 | 2.64 | 7.96* |
| Good looks | 3.70 | 2.10 | 5.29* | 3.65 | 2.23 | 5.80* | 3.75 | 2.55 | 3.74* | 3.14 | 2.83 | .93 | 3.51 | 2.48 | 5.15* |
| Leadership | 3.95 | 2.85 | 2.73* | 3.00 | 2.76 | .81 | 3.60 | 3.05 | 1.70 | 3.21 | 2.93 | .97 | 3.43 | 2.91 | 3.12* |
| Sense of humor | 3.45 | 4.20 | −1.89 | 2.71 | 3.82 | −2.51* | 2.90 | 3.75 | −2.43* | 2.41 | 3.34 | −3.05* | 2.83 | 3.73 | −5.03* |
| Self-confidence | 4.35 | 3.70 | 1.47 | 3.29 | 3.71 | −1.22 | 3.80 | 3.50 | .84 | 4.10 | 3.79 | .90 | 3.93 | 3.69 | 1.29 |
| Dependability | 4.05 | 3.90 | .40 | 3.47 | 3.47 | .00 | 3.95 | 3.60 | 1.13 | 4.07 | 3.97 | .35 | 3.92 | 3.77 | .95 |
| Entertainingness | 3.45 | 3.60 | −.40 | 2.71 | 3.24 | −1.59 | 2.90 | 3.00 | −.35 | 2.21 | 2.86 | −2.63* | 2.76 | 3.14 | −2.51* |
| Kindness | 3.85 | 4.60 | −2.59* | 3.41 | 3.53 | −.33 | 3.60 | 4.25 | −1.99 | 3.86 | 4.21 | −1.08* | 3.71 | 4.17 | −2.83* |
| Ambition | 4.05 | 3.95 | .26 | 3.23 | 4.12 | −2.58* | 3.70 | 4.30 | −2.04 | 3.79 | 3.79 | .00 | 3.72 | 4.01 | −1.73 |
| Sociability | 4.15 | 4.05 | .32 | 3.53 | 3.59 | −.24 | 3.50 | 3.55 | −.15 | 3.24 | 3.41 | −.59 | 3.57 | 3.63 | −.38 |
| Character | 4.00 | 3.90 | .33 | 3.35 | 3.47 | −.52 | 3.90 | 3.90 | .00 | 3.48 | 3.93 | −1.61 | 3.67 | 3.83 | −1.09 |
| General likeability | 4.30 | 4.05 | .64 | 3.41 | 3.41 | .00 | 3.40 | 3.55 | −.57 | 3.14 | 3.45 | −.95 | 3.52 | 3.60 | −.49 |
| Intelligence | 3.85 | 3.80 | .13 | 3.71 | 3.59 | .46 | 4.00 | 3.85 | .45 | 4.34 | 3.90 | 1.58 | 4.02 | 3.80 | 1.32 |
| Religiousness | 3.35 | 4.75 | −3.77* | 3.41 | 3.94 | −1.70 | 3.50 | 4.10 | −1.75 | 4.93 | 4.31 | 2.13* | 3.93 | 4.29 | −1.92 |
| Favorable emotions | 8.80 | 9.55 | −.76 | 6.29 | 5.94 | .37 | 6.35 | 7.35 | −1.33 | 8.83 | 7.45 | 1.44 | 7.74 | 7.62 | .27 |
| Unfavorable emotions | 5.65 | 5.20 | .83 | 4.41 | 4.88 | −.81 | 4.65 | 4.85 | −.70 | 6.24 | 6.21 | .04 | 5.37 | 5.39 | −.07 |

Note.—Positive entries indicate that reactions to the E guises were more favorable than to EJ guises, and minus entries indicate more favorable reactions to EJ guises.

* Significant at or beyond the .05 level, two-tailed test.

The traits used can be seen in Table 1. The subjects were then asked to state what they thought was the religious affiliation of each speaker.

Subjects were also requested to indicate what emotional reactions each voice aroused in them. Four positive and four negative emotional reactions were given them for consideration: happiness, sympathy, fondness, and love; fear, anger, disgust, and hate.

On the last sheet of the booklet, after the 10 response sheets for the voices, the subjects were directed to evaluate their own voices on the same 14 traits already used to evaluate the speakers.

On completion of this part of the experiment, a second questionnaire was distributed which included the following attitude scales, which were answered on standard six-point scales, ranging from complete agreement (+3) to complete disagreement (−3).

1. *F Scale* (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). The complete scale was used.

2. *Anomie Scale* (Srole, 1951). This scale, made up of five items, is designed to measure feelings of normlessness, social dissatisfaction or dysfunction, or group alienation.

3. *Anti-Semitism (A-S) Scale*. Six items appropriate for both Jewish and non-Jewish subjects were taken from the California A-S scale (Adorno et al., 1950).[2]

At the end of the second questionnaire, the subjects were requested to indicate their religious affiliation and their place of birth. When completed, the two booklets were stapled together, so that it was not necessary for the subjects to put their names on either of them.

[2] The items selected are numbered: 1, 4, 8, 13, 14, and 19 in Table 6, pp. 68–69 of the California report.

### *Subjects*

Fourteen subjects were rejected because they did not indicate their religion. The rest were divided into a gentile group numbering 114 subjects and a Jewish group including 64 subjects. The vast majority of the Jewish subjects were born in Canada.

## RESULTS

Comparisons were made between the evaluations of E and EJ guises. For this analysis, attention was given to each pair of voices for each subject, and the pairs were divided, separately for Jewish and gentile subjects, into two categories on the basis of the religion the subjects assigned to the E and EJ guises: (*a*) "correct" identification, including those pairs of voices in which a subject identified the EJ guise as Jewish and associated any other religion with the E member of a given pair; (*b*) "incorrect" identification, when ***both*** members were identified as either Jewish (J-J) or non-Jewish (NJ-NJ).

*Evaluations of EJ versus E Guises, "Correct" Identifications*

Table 1 presents the differences in evaluations of the EJ and E guises correctly identified for each pair of voices separately and for all four pairs combined, for the Jewish subjects. As will be noticed in the Overall column, the Jewish subjects evaluated the E guises reliably more favorably than the EJ guises on Height, Good looks, and Leadership, and the EJ guises more favorably on Sense of humor, Entertainingness, and Kindness. There were no significant differences for the Jewish subjects in their ratings on the other eight traits nor on the quality of emotional reactions aroused by the different speakers.

Table 2 displays the overall results for the gentile subjects. Similar to the Jewish subjects, they too judged the E guises more favorably on Height, Good looks, and Leadership. However, unlike the Jewish subjects, the gentile subjects did not perceive the EJ guises more favorably on any trait. Instead they added one more trait, Self-confidence, to the list of traits on which the EJ guises were comparatively downgraded.

*Evaluations of EJ versus E Guises, "Incorrect" Identifications*

To help in the interpretation of the differential reactions to the EJ and E guises, pairs of voices incorrectly identified were analyzed. This analysis was carried out for Jewish subjects in the instances when both members of a pair were identified as Jewish (J-J), and for gentile subjects when both members were identified as non-Jewish (NJ-NJ). There were not sufficient numbers of NJ-NJ pairs for the Jewish subjects and of J-J pairs for the gentile subjects to warrant a statistical analysis of these pairs. It is of interest in itself that the Jewish subjects tended to assign Jewishness to guises that were not intended by the experimenters to be preceived as such (the E guises), and the gentile subjects exhibited a reverse tendency

TABLE 2

MEANS AND *t* VALUES FOR EVALUATIONS OF E AND EJ GUISES BY GENTILE SUBJECTS, CORRECT IDENTIFICATIONS

| Trait | Speakers | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Co ($df = 28$) | | | Wil ($df = 10$) | | | Aug ($df = 15$) | | | Overall | | |
| | *M* | | *t* | *M* | | *t* | *M* | | *t* | *M* | | *t* |
| | E | EJ | | E | EJ | | E | EJ | | E | EJ | |
| Height | 3.55 | 1.97 | 7.32* | 3.82 | 2.18 | 3.01* | 3.75 | 3.00 | 2.02 | 3.66 | 2.30 | 7.09* |
| Good looks | 3.03 | 1.79 | 5.79* | 3.36 | 2.54 | 2.04* | 2.69 | 2.69 | .00 | 3.00 | 2.20 | 4.31* |
| Leadership | 3.90 | 2.97 | 2.97* | 3.27 | 3.27 | .00 | 3.50 | 3.06 | 1.52 | 3.66 | 3.05 | 2.90* |
| Sense of humor | 3.45 | 3.59 | −.51 | 3.36 | 2.82 | 1.08 | 1.81 | 2.31 | −1.59 | 2.96 | 3.07 | −.53 |
| Self-confidence | 4.10 | 3.90 | .90 | 4.73 | 4.00 | 1.70 | 4.12 | 3.56 | 1.59 | 4.23 | 3.82 | 2.33* |
| Dependability | 3.79 | 3.41 | 1.26 | 3.73 | 3.91 | −.48 | 4.06 | 4.00 | .15 | 3.86 | 3.68 | .84 |
| Entertainingness | 3.52 | 3.31 | .60 | 2.73 | 2.45 | .56 | 2.56 | 2.00 | 1.86 | 3.09 | 2.77 | 1.47 |
| Kindness | 3.48 | 3.76 | −1.16 | 3.82 | 4.00 | −.48 | 4.06 | 4.25 | −.53 | 3.71 | 3.95 | −1.34 |
| Ambition | 4.17 | 4.24 | −.28 | 3.82 | 4.09 | −.71 | 4.44 | 3.37 | 2.61* | 4.18 | 3.96 | 1.02 |
| Sociability | 3.79 | 3.62 | .60 | 3.54 | 3.82 | −.56 | 3.37 | 2.75 | 1.48 | 3.62 | 3.41 | .97 |
| Character | 3.65 | 3.72 | −.25 | 3.00 | 4.36 | −2.89* | 3.87 | 3.87 | .00 | 3.59 | 3.89 | −1.36 |
| General likeability | 3.62 | 3.79 | −.56 | 3.82 | 3.36 | 1.34 | 3.25 | 3.50 | −.64 | 3.55 | 3.62 | −.35 |
| Intelligence | 3.86 | 3.76 | .35 | 4.18 | 3.64 | 1.27 | 4.62 | 4.31 | 1.33 | 4.14 | 3.89 | 1.29 |
| Religiousness | 3.31 | 3.76 | −1.41 | 3.36 | 4.09 | −1.21 | 4.94 | 4.62 | .79 | 3.79 | 4.07 | −1.17 |
| Favorable emotions | 7.65 | 8.59 | −1.18 | 7.82 | 7.54 | .35 | 6.56 | 6.75 | −.18 | 7.37 | 7.86 | −.90 |
| Unfavorable emotions | 5.55 | 5.48 | .12 | 5.64 | 5.00 | .94 | 7.19 | 6.00 | 1.14 | 6.04 | 5.54 | 1.13 |

Notes.—See Table 1.
Ra was a teacher in one class tested: his voices were therefore not used for this class which reduced the total *N* for Ra. As a consequence, there were not enough gentile subjects who recognized Ra "correctly" to warrant statistical analysis. However, those subjects were included in the overall analysis.
* Significant at or beyond the .05 level, two-tailed test.

TABLE 3

MEANS AND *t* VALUES FOR EVALUATIONS OF E AND EJ GUISES BY JEWISH SUBJECTS, INCORRECT IDENTIFICATIONS (J-J)

| Trait | Speakers | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Co ($df$ = 8) | | | Wil ($df$ = 10–11) | | | Aug ($df$ = 8) | | | Overall | | |
| | *M* | | *t* | *M* | | *t* | *M* | | *t* | *M* | | *t* |
| | E | EJ | | E | EJ | | E | EJ | | E | EJ | |
| Height | 3.67 | 2.33 | 4.62* | 4.92 | 3.58 | 3.22* | 4.00 | 2.78 | 2.82* | 4.27 | 2.97 | 5.90* |
| Good looks | 3.33 | 2.44 | 2.53* | 4.25 | 2.33 | 7.37* | 3.11 | 2.44 | 1.26 | 3.63 | 2.40 | 5.29* |
| Leadership | 3.67 | 3.00 | 1.15 | 4.33 | 3.25 | 3.22* | 3.78 | 2.67 | 2.06 | 3.97 | 3.00 | 3.65* |
| Sense of humor | 3.00 | 3.44 | −1.08 | 3.50 | 3.75 | −.43 | 3.33 | 3.22 | .22 | 3.30 | 3.50 | −.66 |
| Self-confidence | 3.89 | 2.89 | 2.45* | 4.54 | 4.00 | 1.26 | 4.33 | 3.11 | 3.35* | 4.28 | 3.38 | 3.59* |
| Dependability | 3.56 | 3.33 | .66 | 4.36 | 4.27 | .20 | 4.67 | 3.89 | 3.50* | 4.21 | 3.86 | 1.41 |
| Entertainingness | 3.33 | 2.89 | 1.08 | 2.92 | 3.92 | −1.86 | 3.22 | 2.44 | 1.21 | 3.13 | 3.17 | −.10 |
| Kindness | 3.67 | 4.22 | −1.39 | 4.00 | 4.67 | −1.77 | 4.00 | 4.22 | −.43 | 3.90 | 4.40 | −1.97 |
| Ambition | 3.67 | 3.33 | .55 | 4.25 | 4.50 | −.55 | 4.33 | 3.78 | .90 | 4.10 | 3.93 | .49 |
| Sociability | 4.00 | 3.22 | 1.79 | 4.58 | 4.25 | 1.00 | 4.00 | 3.56 | 1.51 | 4.23 | 3.73 | 2.24* |
| Character | 3.44 | 3.11 | .82 | 4.67 | 4.42 | .62 | 4.00 | 3.67 | 1.00 | 4.10 | 3.80 | 1.33 |
| General likeability | 3.67 | 3.44 | .42 | 3.83 | 3.92 | −.25 | 3.78 | 3.56 | .80 | 3.77 | 3.67 | .42 |

Note.—See Table 1.
Because of limitations in the digital computer programs for *t* test, at McGill, only the first 12 traits were analyzed in the instances of "incorrect" identifications.
The reason for Ra's absence from this table is similar to the one given under Table 2.
* Significant at or beyond the .05 level, two-tailed test.

in that they identified less accented guises (EJ guises) as Jewish.

The *t* values for the Jewish subjects who associated both guises of a given pair with a Jewish speaker are presented in Table 3. The results display some similarity and some dissimilarity with those obtained when only one member of a pair was identified as Jewish. Again the accented guises were downgraded on Height, Good looks, and Leadership. But

TABLE 4

MEANS AND *t* VALUES FOR EVALUATIONS OF E AND EJ GUISES BY GENTILE SUBJECTS, INCORRECT IDENTIFICATIONS (NJ-NJ)

| Trait | Speakers | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Co ($df$ = 12–13) | | | Ra ($df$ = 14–15) | | | Wil ($df$ = 28–29) | | | Aug ($df$ = 35–37) | | | Overall | | |
| | *M* | | *t* | *M* | | *t* | *M* | | *t* | *M* | | *t* | *M* | | *t* |
| | E | EJ | | E | EJ | | E | EJ | | E | EJ | | E | EJ | |
| Height | 3.79 | 2.86 | 3.48* | 3.81 | 2.87 | 3.76* | 4.50 | 3.30 | 5.29* | 3.95 | 3.40 | 2.05* | 4.07 | 3.21 | 6.21* |
| Good looks | 3.69 | 2.31 | 6.50* | 3.62 | 2.94 | 2.55* | 3.77 | 2.77 | 3.43* | 3.76 | 3.08 | 2.69* | 3.73 | 2.85 | 6.09* |
| Leadership | 4.29 | 3.00 | 2.39* | 3.69 | 3.50 | .72 | 3.60 | 3.40 | .65 | 4.00 | 3.29 | 3.06* | 3.87 | 3.32 | 3.44* |
| Sense of humor | 3.64 | 3.36 | .77 | 3.19 | 3.94 | −2.42* | 3.17 | 3.03 | .49 | 2.97 | 2.81 | .55 | 3.16 | 3.14 | .13 |
| Self-confidence | 4.57 | 3.93 | 1.80 | 4.20 | 3.87 | .96 | 4.00 | 3.90 | .42 | 4.58 | 3.79 | 2.93* | 4.34 | 3.85 | 3.24* |
| Dependability | 4.29 | 4.00 | .89 | 4.20 | 3.60 | 1.85 | 3.80 | 4.00 | −.80 | 4.60 | 3.95 | 3.02* | 4.25 | 3.92 | 2.39* |
| Entertainingness | 3.43 | 3.50 | −.19 | 2.87 | 3.75 | −2.05 | 3.37 | 3.37 | .00 | 3.05 | 3.11 | −.18 | 3.17 | 3.35 | −.99 |
| Kindness | 4.21 | 4.29 | −.17 | 3.62 | 3.44 | .52 | 3.70 | 3.87 | −.65 | 4.32 | 4.34 | −.11 | 4.00 | 4.04 | −.28 |
| Ambition | 4.36 | 3.29 | 2.69* | 4.19 | 4.06 | .36 | 3.83 | 4.30 | −1.78 | 4.13 | 3.87 | 1.04 | 4.08 | 3.95 | .84 |
| Sociability | 3.71 | 3.50 | .45 | 3.69 | 3.81 | −.37 | 3.90 | 3.63 | 1.04 | 3.92 | 3.66 | 1.04 | 3.85 | 3.65 | 1.25 |
| Character | 4.00 | 3.93 | .19 | 3.44 | 3.81 | −1.19 | 3.80 | 3.97 | −.62 | 4.50 | 4.10 | 1.53 | 4.04 | 3.99 | .34 |
| General likeability | 4.07 | 3.86 | .56 | 3.94 | 3.44 | 1.46 | 4.00 | 4.03 | −.13 | 3.95 | 3.92 | .10 | 3.98 | 3.87 | .74 |

Note.—See Table 1.
The reason given under Table 3 for analyzing only the first 12 traits applies also to this table.
* Significant at or beyond the .05 level, two-tailed test.

these guises did not elicit more favorable reactions to any trait; instead they were evaluated less favorably on Self-confidence and Sociability.

The *t* values for the gentile subjects when they attributed any religion but Jewish to both members of a pair (i.e., incorrect identification) are presented in Table 4. The results show good agreement with those obtained for gentile subjects in the case of correct identifications. As can be seen in the extreme right-hand column of Table 4, the accented guises were evaluated less favorably on Height, Good looks, Leadership, and Self-confidence, as well as on Dependability.

It should be noticed, in Tables 1–4, that there was considerable consistency in the data for all four speakers.

### *Comparison of Evaluations Given by Jewish and Gentile Subjects*

For the correct identification pairs, the evaluations of the E guises given by Jewish subjects were compared with the evaluations of the same guises given by gentile subjects, and a similar analysis was carried out for the evaluations of the EJ guises by the two groups of subjects. Table 5 shows that there was very little difference between the two groups in their reactions to the E and EJ voices.

### *Comparison of Self-Evaluations*

The subjects' ratings of their own voices were grouped into three clusters: *General Evaluation* which included ratings on Good looks, Self-confidence, Kindness, Ambition, Sociability, Character, and General likeability; *Dependability* composed of Leadership, Dependability, and Character; and the third cluster *Affability* including Good looks, Sense of humor, Entertainingness, and General likeability. These three clusters seem to answer the following questions about one's self-evaluation: "Am I good or bad?" "Can people count on me?" and "Am I desired as a friend?," respectively. This classification arose from a recent factorial study on social perception (Levy & Dugan, 1960) which used traits similar to those in the present study.

The self-ratings of the Jewish subjects on these three clusters and on Height, Intel-

TABLE 5

MEANS AND *t* VALUES FOR COMPARISON BETWEEN JEWISH AND GENTILE SUBJECTS ON EVALUATIONS OF E AND EJ GUISES, CORRECT IDENTIFICATIONS

| Trait | E | | | EJ | | |
|---|---|---|---|---|---|---|
| | *M* | | *t* | *M* | | *t* |
| | Jewish | Gentile | | Jewish | Gentile | |
| Height | 3.79 | 3.66 | .65 | 2.64 | 2.30 | 1.87 |
| Good looks | 3.51 | 3.00 | 2.63* | 2.48 | 2.20 | 1.59 |
| Leadership | 3.43 | 3.66 | −1.09 | 2.91 | 3.05 | −.74 |
| Sense of humor | 2.83 | 2.96 | −.64 | 3.73 | 3.07 | 2.79* |
| Self-confidence | 3.93 | 4.23 | −1.32 | 3.69 | 3.82 | −.69 |
| Dependability | 3.92 | 3.86 | .31 | 3.77 | 3.68 | .47 |
| Entertainingness | 2.76 | 3.09 | −1.49 | 3.14 | 2.77 | 1.65 |
| Kindness | 3.71 | 3.71 | −.03 | 4.17 | 3.95 | 1.06 |
| Ambition | 3.72 | 4.18 | −2.32* | 4.01 | 3.96 | .25 |
| Sociability | 3.57 | 3.62 | −.28 | 3.63 | 3.41 | 1.07 |
| Character | 3.67 | 3.59 | .41 | 3.83 | 3.89 | −.36 |
| General likeability | 3.52 | 3.55 | −.14 | 3.60 | 3.62 | −.09 |
| Intelligence | 4.02 | 4.14 | −.63 | 3.80 | 3.89 | −.45 |
| Religiousness | 1.81 | 1.67 | .63 | 4.29 | 4.07 | .98 |
| Favorable emotions | 7.74 | 7.37 | .52 | 7.62 | 7.86 | −.35 |
| Unfavorable emotions | 5.37 | 6.04 | −1.45 | 5.39 | 5.54 | −.31 |

Note.—Positive entries indicate that Jewish subjects reacted more favorably on the average than did gentile subjects; minus entries indicate more favorable reactions for gentile than for Jewish subjects.
* Significant at or beyond the .05 level, two-tailed test.

TABLE 6

MEANS AND *t* VALUES FOR COMPARISON BETWEEN JEWISH AND GENTILE SUBJECTS ON SELF-EVALUATION, ATTITUDES, AND IDENTIFICATIONS OF VOICES AS JEWISH

| | *M* | | *t* |
|---|---|---|---|
| | Jewish | Gentile | |
| General evaluation of self | 32.13 | 28.41 | 3.54* |
| Dependability of self | 12.26 | 10.59 | 3.72* |
| Affability of self | 19.09 | 17.36 | 2.37* |
| Height of self | 4.11 | 3.51 | 2.47* |
| Intelligence of self | 4.24 | 3.82 | 2.38* |
| Religiousness of self | 2.80 | 2.79 | .04 |
| F Scale | −22.81 | −20.62 | −.54 |
| A-S scale | −11.22 | −8.74 | −1.77 |
| Anomie Scale | −4.87 | −5.21 | .28 |
| EJ guises identified as Jewish | 3.93 | 2.41 | 7.31* |
| E guises identified as Jewish | 1.65 | 1.23 | 3.05* |

Note.—Positive entries indicate that the mean for the Jewish subjects was higher than the mean for the gentile subjects; minus entries indicate that the mean for the gentile subjects was higher than the mean for the Jewish subjects.
* Significant at or beyond the .05 level, two-tailed test.

ligence, and Religiousness were compared with the self-ratings of the gentile subjects on these same variables. Table 6 shows that the Jewish subjects rated themselves reliably more favorably than did the gentile subjects on all clusters and individual traits except Religiousness.

Table 6 also indicates that the two groups did not differ in their mean scores on the F Scale, the Anomie Scale, and the A-S scale.

The number of E and EJ voices identified as Jewish by Jewish subjects was compared with the number so identified by gentile subjects. Table 6 shows that the Jewish subjects clearly categorized more voices as Jewish than did the gentile subjects, this difference being especially pronounced for the EJ guises.

### *Relation of Voice Ratings to Other Variables*

The mean differences in evaluations of the E and EJ guises on each of the 14 traits, combining all pairs correctly identified, were correlated with the F Scale, the Anomie Scale, the A-S scale, and the six self-evaluation variables. The correlations obtained were generally not significant. Only a few occasional significant entries appeared and these appeared as isolated cases.

No relation was found between the number of voices identified as Jewish and degree of anti-Semitism, as might be expected from the work of Allport and Kramer (1946), nor with the F Scale or the Anomie Scale.

## DISCUSSION

### *Evaluation of Voices*

The most prominent finding is the devaluation of the accented guises on Height, Good looks, and Leadership. This reaction appears on both correct and incorrect identifications and for both Jewish and gentile subjects. Thus it is not the Jewish person who was evaluated as shorter, less good looking, and lacking in leadership qualities, but any person with an accent, whether interpreted as being Jewish or non-Jewish. Since the evaluations were depicted in relation to the nonaccented voices of the same speakers, it seems unlikely that the basic quality of the voice per se played any important part in eliciting such reactions. It appears more likely that the accented voices aroused certain perceptual hypotheses which had been acquired through previous experience with people who speak English with an accent. It seems very probable that the accented guises were generally perceived as those of immigrants. It is understandable that an immigrant would not be expected to occupy positions of leadership and might logically be considered as possessing few leadership qualities. The reason for the relatively unfavorable ratings of the accented guises on height and good looks is less clear. Research on the perception of the size of objects (e.g., Bruner & Goodman, 1947; Carter & Schooler, 1949; Lambert, Solomon, & Watson, 1949) suggests that magnitude is a close associate of value. Extending this relation to person perception, it may well be that immigrants who are typically relegated to low status roles would be regarded as short and comparatively unattractive. In the present case, these two traits are quite highly correlated: $r = .63$ for gentile subjects and .43 for Jewish subjects. There is also the possibility, of course, that the attribution of shorter stature to immigrants in comparison with native North Americans may have some factual basis.

The downgrading of the accented voices on Height, Good looks, and Leadership by both

Jewish and gentile subjects indicates that whatever the basis for hypotheses concerning these traits in immigrants might be, the hypotheses were shared by both groups. However, some noteworthy differences between the two groups appear. The Jewish subjects allowed for some superiority of their immigrant co-religionists: they evaluated the EJ voices more favorably on Sense of humor, Entertainingness, and Kindness, in comparison with voices thought to be those of non-Jews, whereas the gentile subjects did not rate the EJ guises more favorably on any trait. The superiority of the EJ guises did not appear when the Jewish subjects thought that the E guises were those of Jewish people. These findings suggest that Jewish subjects granted Jewish immigrants a better sense of humor, more entertaining qualities, and more kindness, in comparison to native non-Jews but not when compared with native Jews.

The tendency of Jewish subjects to maintain Jewish superiority when comparing Jews with non-Jews is also evident in their evaluations of the speakers on Self-confidence. It can be seen in Tables 2 and 4 that the gentile subjects in all cases evaluated the EJ guises as being less self-confident than the E guises. Since the E guise represented the habitual pronunciation style for all our speakers and the EJ guise was put on, it is possible that the accented guises sounded slightly more hesitant and this may have been interpreted as a lack of self-confidence. Also, it is possible that immigrants were thought to be less self-confident since they live in a nonnative environment. However, when the evaluation of the Jewish subjects on self-confidence is considered it appears that they evaluated the EJ guises as less self-confident in comparison to the E guises only when the E guises were identified as Jewish (Table 3) but not when they were identified as non-Jewish (Table 1). In other words, the Jewish subjects agreed that the accented guises of Jews possessed less self-confidence when compared to those of native Jews but not when compared with those of native non-Jews.

A comparison of these findings with those reported in the French-English study (Lambert et al., 1960) suggests some interesting differences between the Jewish and French Canadian minority groups in the Montreal community. French Canadian students apparently adopted the derogatory stereotypes assigned to French Canadians by the English majority, except that they perceived the French guises as more "kind" and more "religious." Moreover, the French Canadian students tended to accentuate the negative stereotypes of French Canadians in the sense that their evaluations of French guises were reliably less favorable than were the evaluations of French guises by English subjects. The Jewish students in the present study (they agreed that Jewish immigrants possessed unfavorable characteristics) perceived the Jewish immigrant guises as more kind, entertaining and as having a greater sense of humor. Thus there seems to be no indication in the present study that Jewish students adopt negative stereotypes concerning Jews in general even though they did subscribe to unfavorable stereotypes concerning immigrants who happened to be considered Jewish. On the contrary, Jewish students appear to have adopted positive stereotypes concerning Jews, even for Jewish immigrants.

### *Evaluation of Voices and Other Variables*

The lack of a relation between the differential ratings of the guises and any personal or attitude variables corroborates the findings of the Lambert et al. (1960) study and strengthens the proposition that the present technique primarily taps stereotypes rather than attitudes.

The failure to detect variations of emotional reactions to either of the guises of any pair also supports the idea that the subjects did not respond affectively to the task of judging the speakers, but rather took it as an intellectual challenge to make the most accurate judgments.

In this virtually impossible task of evaluating people from their voices (Licklider & Miller, 1951), the subjects apparently seized upon whatever information was available to them. The main sources of information, it seems, were community-wide stereotypes about people with accents, i.e., immigrants.

The present study thus suggests that stereotypes may be functional in making subjectively or objectively correct judgments and need not necessarily function to justify prejudiced attitudes or satisfy personality needs.

*Comparison between Jewish and Gentile Subjects*

Reference to Table 4 shows that Jewish subjects categorized many more voices as Jewish than did the gentile subjects. This is likely due to the greater sensitivity of Jewish subjects to cues of Jewishness in the voices. Although the speakers were selected on the basis of their purity of English expression, the fact is that the speakers were Jewish and had had extensive contact with the Yiddish language. This experience could, of course, leave subtle but detectable traces of Yiddish style in their English speech as Weinreich (1953) has suggested. Jewish subjects would certainly be better acquainted than non-Jewish subjects with cues of Jewishness in speech.

The unexpected finding that Jewish students have decidedly more favorable self-images than gentile students warrants further study. We can only speculate about its meaning. Possibly, Jewish students, as minority group members, have a greater need for self-glorification than do gentile students. Or, in view of the great emphasis traditionally placed on intellectual achievement in the Jewish community, Jewish persons who attend college may enjoy comparatively more prestige in their families and social circles than do gentile students. A related possibility is that the Jewish students when evaluating themselves took the Jewish immigrants, represented by the accented guises, as points of reference and upgraded themselves in comparison.

The Jewish students' self-evaluations and their reactions to the voices cast serious doubt on the generality of the phenomenon of Jewish self-hatred (Lewin, 1948) and of related concepts (Sarnoff, 1951). An opposite phenomenon is not uncommon. Although Jewish people tend to cover up any feelings of superiority in contacts with non-Jews, a Jewish observer can readily detect an important sense of pride in being Jewish on the part of a great many Jews.

## SUMMARY

Samples of gentile and Jewish college students were asked to evaluate the personality characteristics underlying eight voices presented to them on tape. Some voices used standard English while others spoke English with a Jewish accent. The subjects were not made aware that actually the same individuals one time spoke without the accent and at another time with the accent, so that comparisons of evaluational reactions to the two guises could be made for each of the four speakers. The comparative favorableness of evaluations of the two guises was correlated with various measures of attitudes toward Jews for both samples of subjects.

The results indicate that the accented guises were comparatively devaluated on height, good looks, and leadership for both gentile and Jewish subjects and when the accented guise was perceived as being either Jewish or non-Jewish. The gentile subjects did not consider the accented guise as more favorable on any trait while the Jewish subjects evaluated the accented guise more favorably on sense of humor, entertainingness, and kindness. Jewish subjects also categorized many more voices, even those using standard English, as being Jewish than did gentile subjects.

No relations were observed between the differential evaluations of the guises and attitudes toward Jews, a finding which supports the notion that the technique used is especially sensitive to stereotypes rather than to attitudes.

When asked to evaluate their own personalities from their own speech style, Jewish subjects gave evidence of having decidedly more favorable self-images than did gentile subjects.

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# THE EFFECTS OF STATUS, TYPE OF FRUSTRATION, AND AGGRESSION ON VASCULAR PROCESSES [1]

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Several recent investigations (Hokanson & Burgess, 1962; Hokanson & Shetler, 1961) have indicated that the expression of physical or verbal aggression towards a frustrator reduces frustration produced elevations in systolic blood pressure and heart rate. These results were obtained when the frustrator (experimenter) was introduced to college subjects as "an undergraduate experimental assistant" (low status frustrator); and when the frustration involved a series of insults and degrading remarks concerning the subject's intellectual performance (ego threat). The purpose of the present study is to investigate two variables within this paradigm: status of the frustrator and type of frustration. This involves a comparison of the vascular processes following frustration and aggression with a high versus a low status frustrator and with an ego threat versus a blocked goal type of frustration.

## PROCEDURE

In keeping with the two above mentioned investigations in this series the procedure involved: an initial 8-minute adaptation period, followed by the frustration manipulations (ego threat, blocked goal, no frustration), with subsequent opportunity or no opportunity to aggress verbally (via a questionnaire) towards the frustrator (experimenter). This design was utilized for both a low and a high status experimenter. Heart rate was measured continuously and systolic blood pressure at about 2-minute intervals over the entire procedure, with the critical measurements being before and after frustration and immediately after opportunity to aggress.

### *Subjects*

Eighty-four (48 female and 36 male) white, college age subjects were used in this $2 \times 2 \times 3$ factorial design, with three males and four females in each cell. Half of the subjects were seen by an experimenter who introduced himself as a new faculty member in the Psychology Department at Florida State University (high status experimenter); whereas the remaining 42 subjects had an experimenter who introduced himself as a student doing a project for one of his professors (low status experimenter). In actuality, the same experimenter carried out the research with all subjects.

Within each status category, one-third of the subjects were exposed to an ego threat type of frustration, one-third to a blocked goal frustration, and the remaining 14 subjects were placed in a no frustration control condition.

Immediately following the frustration manipulations, half of the subjects in each group were given an opportunity to express aggression towards the experimenter by filling out a questionnaire about the experimenter's general competence as a researcher and his ability to relate to subjects. The "no opportunity to aggress group" was asked to fill out a rather innocuous questionnaire, of similar length, dealing with attitudes toward watching television.

### *Frustration Manipulations*

The subjects were initially told that this was an experiment dealing with some physiological concomitants of doing intellectual work. To aid in establishing this deception all subjects were administered the Picture Completion subtest of the WAIS after the 8-minute adaptation period. Following this test an additional 2-minute rest was given in order to re-establish base levels for the systolic pressure and heart rate.

Subjects in the ego threat frustration condition were asked to count backwards from 100 to 0 by two's as quickly as they could. Following a standardized procedure during this counting, the experimenter repeatedly interrupted and harassed the subject for counting too slowly, having the subject start over three times. After 1 minute, the experimenter asked that the counting be stopped, stating that this data could not be used owing to the subject's uncooperative attitude.

The 28 subjects under goal blocking frustration were also asked to count backwards from 100 to 0 by two's, with the admonition that maximum effort and speed were important in this part of the experiment. The subjects were further instructed that since speed was so critical, this project had received funds with which to pay the subject $4.00 if he completed the counting within a specified time limit. At the completion of the counting, the subject was told that while he had finished within the time limit,[2] it was the experimenter's

[1] This research was supported in part by the Research Council of Florida State University.

[2] This instruction was included so that the goal blocking frustration would be, in a gross way at

impression that he had not devoted maximum effort to the task; and therefore, would not receive the $4.00.

The 28 subjects in the no frustration condition were allowed to count backwards to zero without interruption, with the experimenter remarking "Good" at the completion of the series.

Each frustration manipulation took 1 minute. The immediately subsequent opportunity or no opportunity to aggress conditions (filling out the questionnaire about the experimenter or about television) took 2 minutes. Blood pressure and heart rate were measured before and after each manipulation. Systolic pressure was obtained via a sphygmomanometer operated by the experimenter. The heart rate apparatus consisted of a rubber diaphragm transmitting pulses from the carotid artery through a pneumatic system, with a pen marking pulses on a constant speed kymograph.

## RESULTS

Analyses of the changes in systolic blood pressure and heart rate resulting from the frustration manipulations are presented in Tables 1 and 2. The significant main effects for Frustration in each analysis, along with the Duncan range test results indicate that both the Ego Threat and Goal Blocking frustrations produced greater increases in the vascular processes than the No Frustration control condition. The mean increases for Ego Threat were 12.9 millimeters of Hg and 9.9 beats per minute; for Goal Blocking, 14.7 millimeters of Hg and 11.6 beats per minute; and No Frustration, 4.7 millimeters of Hg and 4.1 beats per minute.

With respect to the Status variable in each table there are no significant effects, although both systolic pressure and heart rate showed a trend towards some elevation in the High Status-No Frustration condition over the comparable Low Status cell.

Table 3 presents the analysis of variance and results of the Duncan multiple range test for change in systolic blood pressure after the aggression opportunities, with prefrustration base level as reference. The significant main effect for Frustration indicates that relative to subjects in the No Frustration condition, frustrated subjects (Ego Threat or Blocked Goal) manifested a more elevated systolic blood pressure immediately after the aggression phase of the experiment (8.1 millimeters and 7.5 millimeters, respectively, versus 3.9 millimeters).

With respect to the status variable in Table 3, the significant $F$ ratio suggests that subjects who interacted with the high status experimenter had higher systolic elevations following the aggression manipulations than subjects seen by the low status experimenter (8.3 millimeters versus 4.7 millimeters).

Reference to the first two terms in Table 4 suggests the same pattern of results with the

TABLE 1

INCREASE IN SYSTOLIC BLOOD PRESSURE AFTER FRUSTRATION

| Source | *df* | *SS* | *MS* | *F* |
|---|---|---|---|---|
| Frustration | 2 | 1608 | 804 | 15.2** |
| Status | 1 | 114 | 114 | |
| Frustration × Status | 2 | 236 | 118 | |
| Residual | 78 | 4144 | 53 | |
| Total | 83 | 6102 | | |

Cell Means of Systolic Changes

| Frustrator | Ego Threat | Goal Blocking | No Frustration |
|---|---|---|---|
| High status experimenter | $14.3_b$ | $13.7_b$ | $7.7_{ab}$ |
| Low status experimenter | $11.4_b$ | $15.7_b$ | $1.6_a$ |

Note.—Cells with different subscripts are significantly different from one another at the .05 level by Duncan multiple range test.

** $p < .01$.

TABLE 2

INCREASE IN HEART RATE AFTER FRUSTRATION

| Source | *df* | *SS* | *MS* | *F* |
|---|---|---|---|---|
| Frustration | 2 | 840 | 420.0 | 9.19** |
| Status | 1 | 150 | 150.0 | |
| Frustration × Status | 2 | 239 | 119.5 | |
| Residual | 78 | 3567 | 45.7 | |
| Total | 83 | 4796 | | |

Cell Means of Heart Rate Changes

| Frustrator | Ego Threat | Goal Blocking | No Frustration |
|---|---|---|---|
| High status experimenter | $12.3_b$ | $10.6_b$ | $7.0_{ab}$ |
| Low status experimenter | $7.4_{ab}$ | $12.6_b$ | $1.1_a$ |

** $p < .01$.

least, as "arbitrary" as the ego threat frustration. Pastore (1952) has suggested that the arbitrariness of frustration is an important variable in the instigation to aggression.

heart rate measure. Frustrated subjects had more elevated postaggression heart rates (Ego Threat = 6.7 beats per minute; Goal Blocking = 5.2 beats per minute) than nonfrustrated subjects (3.1 beats per minute). Similarly, subjects seen by the high status experimenter had higher "residual" heart rates (6.9 beats per minute) than those with the low status experimenter (3.0 beats per minute).

The significant interaction terms in Tables 3 and 4 may best be viewed by reference to the cell means and range test results at the bottom of each table. With respect to postaggression systolic elevations (Table 3) it can be noted that with the low status experimenter, subjects who were placed in either of the high frustration conditions and subsequently given an opportunity to aggress manifested returns of systolic pressure to levels not significantly different from the no frustration control levels (Column 1 at the bottom of Table 3). On the other hand, frustrated subjects given no opportunity to aggress towards the low status experimenter maintained significantly elevated blood pressures relative to the nonfrustrated subjects (8.3 and 9.4 millimeters versus 2.6 millimeters).

TABLE 3

SYSTOLIC CHANGE AFTER AGGRESSION RE BASE LEVEL

| Source | *df* | *SS* | *MS* | *F* |
|---|---|---|---|---|
| Frustration | 2 | 293 | 146.5 | 5.68** |
| Status | 1 | 275 | 275.0 | 10.66** |
| Opportunity | 1 | 55 | 55.0 | |
| Frustration × Status | 2 | 23 | 11.5 | |
| Frustration × Opportunity | 2 | 98 | 49.0 | |
| Status × Opportunity | 1 | 139 | 139.0 | 5.39* |
| Frustration × Status × Opportunity | 2 | 52 | 26.0 | |
| Residual | 72 | 1854 | 25.8 | |
| Total | 83 | 2789 | | |

Cell Means of Systolic Changes

| Condition | Low status experimenter | | High status experimenter | |
|---|---|---|---|---|
| | Opportunity | No opportunity | Opportunity | No opportunity |
| Ego Threat | $+3.7_{ab}$ | $+8.3_{d}$ | $+8.3_{d}$ | $+12.0_{d}$ |
| Goal Blocking | $+3.4_{ab}$ | $+9.4_{d}$ | $+9.7_{d}$ | $+ 7.4_{bcd}$ |
| No Frustration | $+0.6_{a}$ | $+2.6_{a}$ | $+8.3_{b}$ | $+ 4.0_{abc}$ |

Note.—Cells with different subscripts are significantly different from one another at the .05 level by Duncan multiple range test.
* $p < .05$.
** $p < .01$.

TABLE 4

HEART RATE CHANGE AFTER AGGRESSION RE BASE LEVEL

| Source | *df* | *SS* | *MS* | *F* |
|---|---|---|---|---|
| Frustration | 2 | 187 | 93.5 | 3.22* |
| Status | 1 | 312 | 312.0 | 10.76** |
| Opportunity | 1 | 40 | 40.0 | |
| Frustration × Status | 2 | 78 | 39.0 | |
| Frustration × Opportunity | 2 | 256 | 128.0 | 4.41* |
| Status × Opportunity | 1 | 59 | 59.0 | |
| Frustration × Status × Opportunity | 2 | 232 | 116.0 | 4.00* |
| Residual | 72 | 2088 | 29.0 | |
| Total | 83 | 3252 | | |

Cell Means of Heart Rate Changes

| Condition | Low status experimenter | | High status experimenter | |
|---|---|---|---|---|
| | Opportunity | No opportunity | Opportunity | No opportunity |
| Ego Threat | $+1.7_{abc}$ | $+6.3_{cde}$ | $+5.7_{bcde}$ | $+13.1_{f}$ |
| Goal Blocking | $+1.1_{ab}$ | $+8.0_{e}$ | $+8.6_{e}$ | $+ 2.9_{abcd}$ |
| No Frustration | $+1.7_{abc}$ | $-0.6_{a}$ | $+6.9_{de}$ | $+ 4.3_{bcde}$ |

Note.—Cells with different subscripts are significantly different from one another at the .05 level by Duncan multiple range test.
* $p < .05$.
** $p < .01$.

This pattern of systolic changes was not found with the high status experimenter. To the contrary, frustrated subjects given an opportunity to aggress maintained systolic elevations as high as the frustrated-no opportunity subjects and were significantly higher than the comparable "opportunity to aggress" subjects seen by the low status frustrator (Column 3 compared to 4 and 1, respectively). Even further, the no frustration-opportunity group manifested significantly elevated pressures relative to the no frustration-no opportunity subjects (8.3 millimeters versus 4.0 millimeters), as if merely having the opportunity to aggress against a high status object is "tension" producing.

The pattern of heart rate changes (Table 4) with the low status experimenter is essentially the same as obtained with the systolic measure. Subjects in the frustration-opportunity to aggress conditions showed a

return of heart rate to a level comparable to the no frustration subjects (1.7 and 1.1 beats per minute versus 1.7 beats per minute); whereas the frustrated-no opportunity to aggress subjects maintained significantly elevated heart rates relative to their no frustration control group (6.3 and 8.0 beats per minute versus −0.6 beats per minute). Within the low status experimenter-ego threat conditions however, there was only a trend toward an elevation of the no opportunity group over the opportunity to aggress cell (6.3 beats per minute versus 1.7 beats per minute).

With the heart rate measure it can again be noted that the pattern of cell means is different with the high status experimenter. Although not as clear-cut as the systolic pressure results, frustrated-opportunity to aggress subjects did not manifest any substantial return to base level heart rates—and the cell means are not significantly different from the frustrated-no opportunity to aggress means with the low status frustrator (Column 3 versus 2).

In addition, with the high status experimenter there appears to be a different pattern of heart rate means depending on the type of frustration. For example, under ego threat, the no opportunity to aggress cell (13.1 beats per minute) is significantly higher than the opportunity cell (5.7 beats per minute); whereas the reverse is found under blocked goal frustration (opportunity = 8.6 beats per minute; no opportunity = 2.9 beats per minute).

To summarize the findings consistent over both physiological measures: Either ego threat or blocked goal frustration produced a significant increase in systolic blood pressure and heart rate relative to a no frustration control group. Being given a subsequent opportunity to verbally aggress against a low status frustrator resulted in a return of vascular processes to levels not significantly different from no frustration control group levels; whereas being given no opportunity to aggress towards the low status frustrator resulted in maintenance of the frustration produced elevations. With a high status frustrator however, opportunity to aggress following a frustration in most instances did not substantially reduce the frustration produced vascular elevations relative to comparable "opportunity" conditions wih a low status frustrator. Further indication of the "arousing" quality of the high status experimenter is seen in the significant main effect for Status in both Tables 3 and 4. Subjects who interacted with the high status experimenter had significantly elevated systolic pressure and heart rate at the close of the experiment when compared to subjects seen by the low status experimenter. A similar elevation was found for subjects who underwent frustration as compared to the no frustration subjects.

## DISCUSSION

The portion of the current results dealing with the low status frustrator is consistent with earlier findings in this series (Hokanson & Burgess, 1962; Hokanson & Shetler, 1961). Essentially, the results indicate that opportunity for verbal aggression towards a frustrator following an ego threat type of frustration reduces frustration produced elevations in systolic blood pressure and heart rate. In addition, subjects having no post-frustration opportunity for aggression maintain elevated vascular processes.

The data also indicate that the same results are obtained when the frustration involves a blocked goal imposed by a low status experimenter rather than an ego threat. This comparability of effect appears to be noteworthy in view of the fact that most studies measuring physiological response to frustration have utilized insults or ego devaluation (Ax, 1953; Funkenstein, King, & Drolette, 1957; Schachter, 1957). Here then is evidence that within the limitations of this laboratory experiment, when arbitrariness of frustration is controlled, goal blocking produces approximately the same vascular elevations as ego threat; and further, that subsequent opportunity for verbal aggression also reduces these vascular processes. Hence, although the original goal ($4.00 reward) is not achieved, opportunity for aggressive interaction with the instrument of the goal blocking appears to be associated with "tension" reduction.

With the high status experimenter however, the reduction in arousal does not occur fol-

lowing an opportunity to aggress. This result might well be expected on the basis of previous results indicating that subjects express relatively little aggression towards high status frustrators (Cohen, 1955; Graham, Charwat, Honig, & Weltz, 1951; Kelley, 1951; Thibaut & Riecken, 1955). In the present research however, a comparison of the verbal aggression questionnaires between subjects frustrated by the high or low status experimenter indicates no significant difference in amount of aggression expressed. Moreover, analysis of the responses suggests that each group expressed predominantly neutral or even slightly positive evaluations of each experimenter. Thus, differences in overt expression of aggression can be ruled out as a factor in the differential vascular reactions found in the present research. It is possible, however, that the 2 minutes for the questionnaire was too brief a period to furnish an adequate measure of amount or intensity of aggressive responses. There is suggestive evidence, however, that merely having an opportunity to aggress against a high status person is physiologically arousing in itself. This can be seen in the elevated systolic blood pressure at the close of the experiment in the high status-no frustration-opportunity to aggress cell (Table 3). In addition, the significant main effects for Status in both Tables 3 and 4 lend support to this conclusion.

With respect to the operation of "catharsis" phenomena then, the current data suggest that physical arousal produced by either an ego threat or goal blocking is reduced by having an opportunity to aggress verbally against a low status frustrator. On the other hand, this arousal reduction does not occur when a high status frustrator is involved. While the present results allow no conclusions about reductions in "aggressive drive," they do raise a question about the generality of the "tension reducing" function usually associated with overt aggression.

## SUMMARY

Eighty-four college age subjects of both sexes were placed in one of three frustration conditions (ego threat, blocked goal, no frustration) and subsequently given either an opportunity to aggress or no opportunity to aggress verbally against the frustrator. A third, orthogonal variable investigated was the status of the frustrator, with half of the subjects seen by an experimenter who introduced himself as a new faculty member (high status), while the remaining subjects were seen by a "psychology student" (low status). Systolic blood pressure and heart rate were measured before and after the frustration manipulation and immediately after the "aggression" phase of the experiment.

The results which were consistent over both physiological measures, are as follows:

1. Both ego threat and blocked goal frustrations produce a significant increase in systolic blood pressure and heart rate relative to the no frustration control group.

2. For both types of frustration, having a postfrustration opportunity to verbally aggress against the low status frustrator results in a return of vascular processes to levels not significantly different from those of a no frustration control group; whereas having no aggression opportunity with a low status frustrator results in maintenance of the frustration produced elevations.

3. With a high status frustrator, opportunity to aggress, on the whole did not substantially reduce vascular elevations relative to comparable opportunity to aggress with a low status frustrator.

4. Subjects who were in one of the frustration conditions or were seen by the high status experimenter had significantly elevated vascular processes at the close of the experiment (postaggression measure) when compared to subjects in the no frustration or low status experimenter conditions.

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# STUDIES IN EFFICIENCY:

## VERBAL CONDITIONING AS A FUNCTION OF DEGREE OF TASK CENTERING[1]

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It has been shown that the rate of conditioning of the galvanic skin response (GSR) is a function of the interaction between task requirements and degree of task centering, as induced by instructions. Thus, self-centered (SC) subjects, conditioned more rapidly than other centered (OC) subjects when the instructions were to relax, which, in effect, constituted a requirement to resist formation of a conditioned response (CR). On the other hand, OC subjects, assumed to be more task centered and therefore focused on task requirements, conditioned more rapidly than SC subjects when the instructions were to solve a problem and, in effect, to accelerate the formation of a CR (Wishner, 1962). These results were interpreted as support for the notion of efficiency formulated previously (Wishner, 1955) in that increased task centering led to increased efficiency in meeting task requirements regardless of whether the more efficient response was positive, as in accelerated acquisition of a conditioned GSR, or negative, as in delayed acquisition of a CR. In other words, relatively efficient subjects could accelerate or delay forming CRs, as required, while inefficient subjects could not meet either requirement as well. The present paper reports the results of an extension of this experimental paradigm and the application of the concept of efficiency to verbal conditioning.[2]

### METHOD

*Subjects.* Ninety male volunteer college students were assigned randomly to experimental groups—SC and OC—and three experimental conditions—relaxed situation (R), problem-plus situation (P+), and problem-minus situation (P−). Ages ranged from 17–37, with a mean of 19.86. For the most part the subjects were freshmen dormitory students, but there were also a number of upperclassmen and graduate students.

*Instructions.* Experimental groups and conditions were established by the following instructions. A pencil rap was utilized as a reinforcement for verbal conditioning.

#### *Degree of Task Centering*

[SC]: I want to measure how neurotic you are. I can do this by seeing how you perform on a simple test which I have here. This test may seem simple to you, but we psychologists have been able to develop very simple tests to determine basic personality structures. Your behavior is therefore on trial. I cannot tell you how this test works at this time, but I feel that it will become readily apparent to you . . . [followed by R, P+, or P− instructions, as shown below]. Remember, how well you do, will determine how neurotic you are.

[OC]: As you may or may not know, I am working towards a Doctor's Degree and the study in which I have asked you to participate is part of my final requirements. This study is the culmination of several years research and reading and the success or failure will determine whether I get my degree or not. As you can see, I have a lot involved in terms of time and outcome and hope that you will give me all the assistance you possibly can . . . [followed by R, P+, or P− instructions]. I hope that you will remember that the success or failure of my work depends on this study.

#### *Problem Orientation*

[R]: I am going to give you a pack of cards and on each card you will find three printed words. Your task will be to read one word from each card and then pass on to the next card. You will notice that I will sometimes rap my pencil on the desk after certain words. I am interested in the kinds of words you say, but do not pay any attention to what I say or do while you are reading the words. Since I will record these words, please do not go too fast. Do you have any questions? [These instructions were

[1] Part of this study was supported by Grant #M-4211 of the United States Public Health Service to the second author.

[2] For general reviews of the work on verbal conditioning, see Krasner (1958) and Salzinger (1959). Studies of particular relevance to this one are considered in the Discussion.

intended to induce the requirement of relaxing and making the responses independent of the reinforcement contingency, or, in effect, random.]

[P+]: I am going to give you a pack of cards and on each card you will find three printed words. I want you to read one word from each card and pass on to the next card. You will notice that I will sometimes rap my pencil on the desk to certain words. Try to say words which make me rap my pencil *more*. Since I will record these words, please do not go too fast. Do you have any questions? [The intention here was to encourage the subject to deduce the nature of the reinforcement contingency and to maximize the reading of reinforced words.]

[P−]: I am going to give you a pack of cards and on each card you will find three printed words. Your task will be to read one word from each card and then pass on to the next card. You will notice that I will sometimes rap my pencil on the desk to certain words. Try to say words which make me rap my pencil *less*. Since I will record these words, please do not go too fast. Do you have any questions? [These instructions were intended to encourage problem solution, as in P+, but with *unreinforced* words as the appropriate response. It should be noted that in this condition the probability of the occurrence of a "correct" response, i.e., the one required by the experimenter, is double that of the P+ condition.]

All the data were collected by the first author and all instructions were administered by him.

### *Technique*

Three words were typed on each of 120 cards. The words were selected from Thorndike and Lorge's (1944) 1,000 most used words. The letter "s" was added to every third meaningful word and then placed on the cards at random. This resulted in 44 words which, in proper English usage, can only be interpreted as nouns (e.g., souls), 19 verbs (e.g., enjoys), and 57 words which may be interpreted either as nouns or verbs (e.g., streams, babies, senses, etc.).[3]

The distribution of words that ended in s per card is shown in Table 1. The randomization of s words was intended to minimize premature awareness of the nature of the reinforcement contingency. At the same time, failure to keep chance probabilities of s responses constant from card to card introduces a remote possibility of a peculiar interaction between the instruction variables and the varying chance probabilities. However, no such interaction was apparent from an inspection of the relative frequencies of s responses to cards with one and two s words, respectively.

TABLE 1

DISTRIBUTION OF S WORDS PER CARD

| Number s words/card | Frequency |
|---|---|
| 3 | 1 |
| 2 | 26 |
| 1 | 65 |
| 0 | 28 |

The cards were so ordered that every block of 10 cards contained an equal number of words ending in s. After each subject, the 10 card blocks were reshuffled. Only words which were meaningful without an s were used. Words such as thus or fullness were not used.

The use of cards rather than merely asking the subject to say words has several important advantages. The control gained over the words assures an operant level high enough for conditioning to take place. Subjects are never at a "loss for words" and dead experimental time is reduced drastically. Recording of responses is simplified and does not require expensive apparatus. Finally, errors by the experimenter in implementing the prearranged reinforcement contingency are minimized.

*Measurement.* The experimental procedure can be divided into three periods: operant, acquisition, and extinction. The operant level was determined by the first 20 cards, when no responses were reinforced. Acquisition and extinction levels were determined by Cards 21–70 and 71–120, respectively.

During the acquisition period the experimenter rapped his pencil on the table each time the subject responded with a word ending in s.

Post-experimental interviews were conducted in order to determine if the subjects had noticed the rapping of the pencil and if so, whether they had inferred correctly its significance.

## RESULTS

The left side of Figure 1 shows the operant level, acquisition, and extinction curves in blocks of 10 trials for each of the groups in each of the conditions. The curves on the right side of Figure 1 combine the data into single points for the operant (Trials 1–20), acquisition (Trials 21–70), and extinction (Trials 71–120) periods, respectively. Our particular interest in this report is in acquisition.

Taking the R, P+, and P− conditions separately, Figure 1 shows that in the R condition, the SC group tends to show some increase in s responses during acquisition over

[3] It is not clear how Greenspoon (1955) and Matarazzo, Saslow, and Pareis (1960) resolved this ambiguity for words not used in context. It is possible that the apparently conflicting results of these studies with respect to conditionability of plural nouns reflect uncontrolled variations in the experimenter's interpretation of the meaning the subject meant to attach to a particular word.

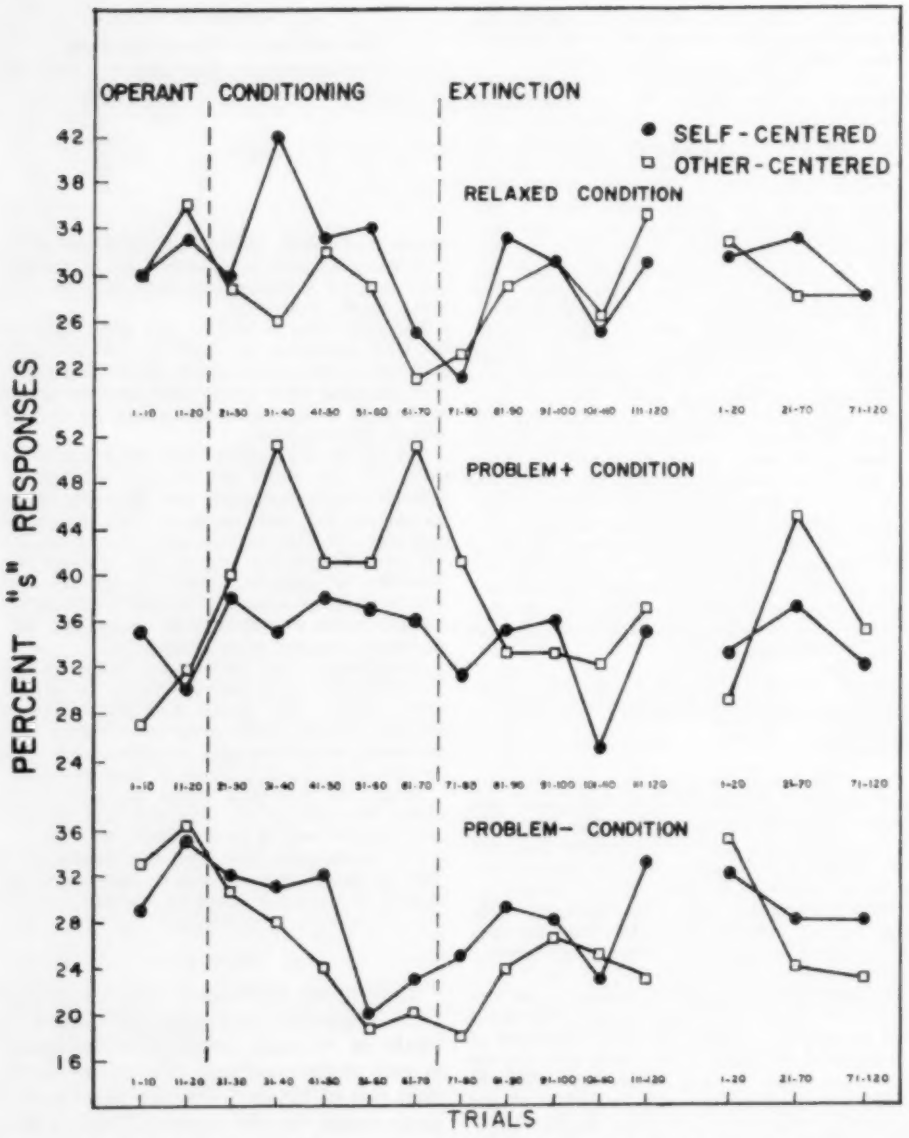


FIG. 1. Operant, acquisition, and extinction curves of both groups in R, P+, and P− conditions.

its operant level. The OC group shows a decrease on all but Trials 41–50, and an overall decrease. The SC group gives more s responses in every block of 10 trials. In the P+ condition, both groups tend to show more s responses during acquisition, as compared to the operant period, but this phenomenon is more striking in the OC group than in the SC group. This time the OC group gives more s responses in every block.

In the P− condition, s responses decrease for both groups during acquisition, but more so for OC subjects than SC subjects. Again, the OC group makes fewer s responses in every block.

The statistical evaluation of these results poses some problems. Unlike the case of GSR conditioning, for example, there is not available a convenient criterion of verbal conditioning which would enable one to count the number of trials to criterion. Nor are latency and amplitude of response parameters relevant to our current considerations. Use of the absolute number of responses during acquisition as the dependent variable would raise questions concerning their dependence on operant level, and it would seem preferable to avoid such problems.

Given the possibility of utilizing parametric tests of the data, an appealing solution is analysis of covariance, with number of s responses during acquisition, adjusted for correlation with operant level, as the dependent variable. Such an analysis permits the utilization of all the data and obviates the necessity for arbitrary decisions as to what constitutes conditioning. One merely compares the response levels, adjusted in terms of a baseline, across the groups. One problem in this procedure was that operant level was obtained after the instructions had been given, and conceivably, operant level might have been influenced by the instructions, which would make impossible a valid adjustment of the acquisition scores. However, inspection of Figure 1 does not show any obvious differences between the groups in operant level. An analysis of variance also failed to show any significant differences between the groups (all $p$'s $> .20$). It was decided, therefore, to treat operant level as if it had been obtained in a manner experimentally independent of the instructions and to perform an analysis of covariance on the acquisition scores.

The results of this analysis are shown in Table 2. An $F$ test for homogeneity of regression revealed no significant heterogeneity ($p > .20$). The results are illustrated in Figure 2 in terms of mean scores during acquisition, adjusted for operant level. As is apparent from Table 2, there is a significant

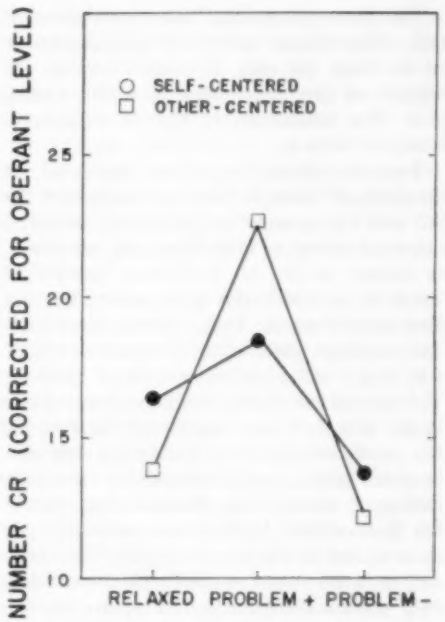


FIG. 2. Mean corrected acquisition scores for task and arousal instructions.

SC–OC × R-P+-P− interaction, and Figure 2 indicates that it is in the predicted direction. Analysis of the differences between cells indicates that the OC group produced significantly more s responses than the SC group in the P+ condition ($p < .025$). In the R and P− conditions, the differences are not significant, although in both cases the OC group gives fewer s responses, which was the essential requirement for all subjects in this condition. It is also clear that task orientation produces a significant difference in number of s responses given by both groups.

TABLE 2

ANALYSIS OF COVARIANCE OF ACQUISITION SCORES

| Source | *df* | Adjusted *SS* | *MS* | *F* |
|---|---|---|---|---|
| SC-OC | 1 | .11 | .11 | — |
| R-P+-P− | 2 | 887.79 | 443.84 | 19.66** |
| Interaction | 2 | 180.15 | 90.07 | 3.99* |
| Within | 83 | 1873.29 | 22.57 | |

* $p < .025$.
** $p < .001$.

The post-experimental interviews revealed that every subject noticed the pencil rapping on the desk, but only 21 could verbalize the relation of the pencil rap to words ending in s. The breakdown of the 21 subjects is found in Table 3.

Two chi square tests were conducted on the data of Table 3. The first compared the SC and OC groups on ability to verbalize the relationship of pencil rapping to words, as shown in the all conditions portion of Table 3, in which the appropriate data are abstracted from the Task instructions portion. This analysis yielded a chi square of 3.34, $(.10 > p > .05)$, for one degree of freedom. The second test made the same comparisons as the first, but only considered the P+ and P− conditions, since these were the only ones in which subjects might reasonably have been seeking a relationship, remembering that in the R condition, subjects were asked to pay no attention to the pencil rapping. The necessary data are shown in the Problem conditions only portion of Table 3. Chi square for this analysis was 4.64 $(.05 > p > .02)$ for one degree of freedom.

It may be worthwhile at this point to make note of some qualitative observations. In general, the reactions of the OC subjects were more homogeneous than those of the SC subjects. The former seemed cooperative and willing to assist the experimenter. The SC group, on the other hand, was heterogeneous in its reactions. Some subjects showed a reluctance to participate while others showed complete acceptance. Some seemed worried during the progress of the experiment, while others appeared relaxed. In general, the SC instructions seemed to disturb most subjects' ability to pay attention to the task instructions. Some reported that they just said words and did not try to make the pencil rap; others began to free associate when the pencil rapped. Similar reports were not heard from the OC subjects.

The SC subjects appeared more concerned with the intrinsic meanings and associations to the words. When they were asked about the significance of the pencil rap, several stated that it was connected to "emotional" words or to words dissimilar to the other words on a card. The OC subjects who did not know the relationship simply stated that they did not know what made the pencil rap and did not try to evaluate the meanings of the words.

TABLE 3

NUMBER OF SUBJECTS ABLE TO VERBALIZE RELATION BETWEEN PENCIL RAPPING AND WORDS ENDING IN S

| Arousal instructions | Task instructions | | | |
|---|---|---|---|---|
| | Relaxed | Problem + | Problem − | Total |
| Self-centered | 2 | 1 | 4 | 7 |
| Other centered | 2 | 5 | 7 | 14 |
| Total | 4 | 6 | 11 | 21 |
| | All conditions | | | |
| | Verbalized | | Not verbalized | |
| Self-centered | 7 | | 38 | |
| Other centered | 14 | | 31 | |
| | Problem conditions only | | | |
| Self-centered | 5 | | 25 | |
| Other centered | 12 | | 18 | |

## DISCUSSION

The main hypothesis of this study, derived from the concept of efficiency previously formulated (Wishner, 1955), stated that self-centered subjects should show a relatively higher response level under relaxed and problem-minus instructions than other centered subjects, while the reverse should be true under problem-plus instructions. More precisely an interaction was predicted such that the relative standings of the SC and OC groups would be a function of the type of task requirement put to them. The basis for these predictions was the assumption that self-centering reduces ability to focus on the requirements of particular tasks—an assumption supported in varying degrees by previous findings in experiments on muscle action potential patterns in reaction time (Niebuhr, 1955), esthetic preferences (Shipley, 1956), cognitive activity in children (Weinberg, 1958), and differential GSR conditioning (Wishner, 1962). The results of the present study provide further support for this hy-

pothesis. Figure 1 shows the differences in a graphic manner while the analysis of covariance (Table 2) substantiates the differences in a statistical sense. It seems reasonable to interpret the significant interaction as evidence of the greater facility of the OC subjects in meeting task requirements. Further support for this point of view is found in the fact that more of the OC subjects could verbalize the nature of the reinforcement contingency in the P+ and P− conditions combined.[4]

In terms of the next aim of this series of studies—the application of the efficiency concept to psychopathology—it would be interesting to compare our results with those obtained in psychopathological groups, particularly since the latter are assumed to be naturally diffuse, which would permit clear-cut predictions relative to the task requirements of any particular conditioning situation. Unfortunately, the type of data necessary for unambiguous comparisons has not yet been reported. Taffel (1955) found that neurotic and psychotic patients who scored high on the Taylor Manifest Anxiety scale showed greater verbal conditioning than those who scored low, but there is no comparison to normals as a whole.

The work of Salzinger and Pisoni (1958, 1960) reported failure to find differences between schizophrenics and normals in conditioned affect statements. However, several ambiguities in their reports make the relevance of their work for the efficiency model questionable. The most important from our point of view is their failure to specify the task requirements for the subjects. To leave the subject free to respond as he wishes without any information as to the nature of the requirements he must meet may have certain advantages for some purposes. However, it leaves a crucial variable in the efficiency model uncontrolled. Beyond this point, the nature of the control group may have significance. Salzinger and Pisoni (1960) utilized medical and surgical patients without psychiatric symptoms as controls. From the viewpoint of efficiency, such subjects may be as diffuse or inefficient with respect to a momentary learning task as schizophrenics, for the variable most directly involved is degree of diffusion rather than any particular symptom syndrome. At the same time, this very critique indicates the possible fruitfulness of future studies of the differences between groups of varying degrees of efficiency in verbal conditioning when the task requirements are made sufficiently clear to the subject.

The principal comparison in the Salzinger and Pisoni (1960) report is on relative extinction rates, with acquisition equalized by matching subjects on number of reinforcements. Again, while no differences between the groups were found, these results seem irrelevant to efficiency. In general, task requirements in extinction seem quite unclear. Perhaps this accounts, at least in part, for the ambiguous results on extinction, and its relation to acquisition, found in the general experimental literature.

Several methodological considerations utilized in this study seem worthy of iteration at this point. Some of the advantages of the forced-choice response procedure have been indicated. It saves time, seems to minimize boredom for the subject, and permits precise application of the reinforcement contingency by the experimenter. Reinforcement via pencil rapping seems like a relatively neutral procedure; at least, it has no obvious verbal content, as many verbal reinforcements are likely to have. At the same time, the relative efficacy of various types of reinforcements still needs elucidation through research.

Matarazzo, Saslow, and Pareis (1960) have pointed to an important problem in the quantification of verbal conditioning. The question at issue is when the conditioning period can be said to begin. Most investigators simply assume that the acquisition period begins at a point arbitrarily determined by the experimenter. But it is known that subjects vary in when they give the first response scheduled to be reinforced. In the study by Matarazzo et al. some subjects did not give an appropriate response until the end of the acquisition trials. An examination of our data indicates that 32% of the subjects said a word that ended in s on the first card of

[4] For a more detailed analysis of this type of interpretation, see Wishner (1962).

the acquisition period, 83% had given a word ending in s by the fourth card, and only 1 subject had not responded by the eighth card. Since such a large percentage of the subjects responded in the first few cards, we have assumed for our purposes that conditioning begins on the first card of acquisition.

Still another methodological consideration concerns the P− condition. The base rate for words ending in s is $\frac{1}{3}$. For other words the rate is $\frac{2}{3}$. This has a rather important effect in the P− situation, since the chances of conforming to the task requirements are much greater than in the R or P+ conditions. An examination of the frequency with which words ending in s appear indicate that an R or P+ subjects can never obtain 100% correct responses since there are 28 cards which do not have a word ending in s (see Table 1). On the other hand, P− subjects did obtain 100% correct responses during acquisition in several of the 10 trial blocks. Therefore, differences between the SC and OC groups cannot be very great. Indeed, under these conditions, any difference in the predicted direction might well be given importance beyond the indicated $p$ value. In any case, it is clear that in future research, this flaw will have to be corrected.

Finally, we believe that the use of the analysis of covariance in this type of research is worthy of further consideration. Assuming that the necessary assumptions can be met, it seems clear that its use permits the utilization of all the data, and, of particular importance, avoids the necessity for arbitrary decisions as to when the subject has been conditioned. However, an important caution to be observed in this respect is that the operant level must be obtained independently of the application of the independent variables.

## SUMMARY

The interaction of self-centered and other centered instructions with three types of task orienting instructions was studied in relation to their effects on verbal conditioning. The task orienting instructions were: to relax, to solve a problem and give correct responses, and to solve a problem and give incorrect responses. From the viewpoint of individual differences in efficiency in meeting task requirements, it was predicted that there would be a significant interaction in the following form: self-centered subjects would show a relatively higher rate of conditioning than other centered subjects under relaxed and problem-minus situation, while other centered subjects would show a relatively higher rate of conditioning than self-centered subjects under the problem-plus instructions. In other words, SC and OC subjects were predicted to be differentially affected by the R, P+, and P− conditions. Ninety subjects were used in a $2 \times 3$ design, 15 subjects in each cell.

An analysis of covariance, with acquisition scores adjusted for operant level, revealed that the interaction was significant at the .025 level. There was also a significantly greater number of other centered subjects who could verbalize the nature of the reinforcement contingency. In general, it appears that self-centered instructions inhibit appropriate learning and reduce the efficiency of behavior. These results were interpreted as support for the formulation of the concept of efficiency, both as a method of analysis of individual differences with respect to task requirements, and as a promising approach to problems of psychopathology.

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# RACIAL PREJUDICE, INTERPERSONAL ATTRACTION, AND ASSUMED DISSIMILARITY OF ATTITUDES [1]

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It has been suggested (Byrne, 1961a) that the degree of attraction between two individuals is determined by four classes of variables: the structural properties of the environment which act to vary propinquity, the strength of the characteristic affiliation motive of each individual, generalization from previous learning with respect to the overt stimulus properties of one another, and the number of reciprocal rewards and punishments which occur during their interaction.

The aim of the present experiments is to examine several aspects of the latter two variables in the context of an investigation of racial prejudice. Specifically, this work was undertaken in order (*a*) to test hypotheses dealing with assumed attitude dissimilarity as a function of racial prejudice and (*b*) to explore the interactive effects of race, racial prejudice, and attitude similarity-dissimilarity in determining interpersonal attraction.

## EXPERIMENT I: RACIAL PREJUDICE AND ASSUMED DISSIMILARITY

### *Background and Hypotheses*

In a preliminary investigation, Wong (1961) tested the proposition that differences in racial prejudice among whites should affect interpersonal attraction toward strangers identified as Negro. On the basis of minimal background data, 73 subjects were asked to make several judgments about a stranger. Attraction was measured by means of two scales of the Interpersonal Judgment Scale (Byrne, 1961a). On this instrument, subjects indicate their personal feelings of liking and disliking with respect to a stranger and also rate his desirability as a work partner. As hypothesized, highly prejudiced subjects responded more negatively to a Negro stranger than to one identified as white. The prediction that subjects low in prejudice would not respond differentially on the basis of race was supported with respect to Personal Feelings. On the Work Partner variable, they actually responded more positively to a Negro than to a white stranger.

Both the balance theory of Heider (1958) and the strain-toward-symmetry formulations of Newcomb (1953) would predict that an individual who dislikes Negroes should assume that they hold attitudes dissimilar from himself. In Newcomb's terminology, if A (highly prejudiced subject) has negative feelings toward B (Negro stranger) and positive feelings toward X (e.g., classical music), symmetry can be obtained by A if he assumes that B dislikes classical music. Similarly, if a subject low in prejudice has positive feelings toward a Negro stranger and positive feelings toward classical music, he achieves symmetry by assuming that the Negro stranger also likes classical music.

There is some experimental support for the general proposition. It has been found that individuals assume greater similarity between themselves and liked others than between themselves and disliked others (even in the absence of actual differences) with respect to personality traits (Fiedler, Warrington, & Blaisdell, 1952) and values (Precker, 1953). In addition, Muraskin and Iverson (1958) reported that as the social distance of a minority group increased, subjects assumed greater dissimilarity between themselves and members of that group with respect to attributed social distance ratings.

[1] This paper is based in part on a master's thesis (Wong, 1961) submitted to the faculty of the Graduate School of the University of Texas.

[2] The authors would like to express their appreciation to the many individuals whose assistance contributed greatly to this project: Warner Burke, Eugene Burnstein, Judy Carter, Gayla Ann Crews, Carole Golightly, Wayne Holtzman, Paul Jennings, Ted Langford, Walton Launey, Dwayne Piercy, Jan Schiefer, Frank Schmidt, James Smith, and Robert Young. We would like to express our special appreciation to M. L. Ore and Carmen Lowry of Huston-Tillotson College for their help and cooperation.

On the basis of Newcomb's (1953) A-B-X model, it is hypothesized that (*a*) highly prejudiced individuals assume a greater degree of dissimilarity between themselves and an unknown Negro than between themselves and an unknown white and (*b*) low prejudiced individuals do not assume differential dissimilarity on the basis of race.

### *Procedure*

A group of 54 students (34 males, 20 females) enrolled in the introductory psychology course at the University of Texas was given the Desegregation Scale (Kelly, Ferson, & Holtzman, 1958) in order to assess the degree of prejudice directed toward Negroes. The D scale contains 26 items dealing with beliefs about Negroes and with attitudes concerning various types of racial interaction. Subjects respond to each item on a five-point scale of agreement-disagreement; high scores indicate unfavorable interracial attitudes. The subjects were divided approximately at the median into subgroups of 24 high prejudiced (scores of 48–82) and 30 low prejudiced (scores of 8–43).

Several weeks later they were called in by a second experimenter. The subjects were then given instructions designed to characterize the experiment as a study of personality judgment based on physical appearance. The experimenter indicated that he had interviewed a number of college students to determine their opinions about several topics and had obtained their photographs. The subjects were asked to study carefully one of the pictures and then to fill out an attitude survey as they believed the depicted student might have done.

The photographs which were given to the subjects were of the college yearbook variety. Half were of Negroes and half of whites. Strangers and subjects were matched by sex. Guesses about the stranger's attitudes were made on the 26-item Survey of Attitudes (Byrne, 1961a) which deals with a variety of topics such as undergraduate marriages, westerns, existence of God, political party, musical comedies, drinking, a Catholic president, premarital intercourse, etc. The attitude scale was altered slightly for this experiment in that each item was measured on a six-point scale with the No Opinion category removed. Half of the subjects filled out this scale with their own opinions prior to the judging task and half just after the judging task.

### *Results and Discussion*

The scoring was on the basis of the number of attitudes out of the 26 on which the subject assumed dissimilarity in terms of direction of opinion (rather than degree). One point was assigned for each item on which the stranger was guessed to be of an opposing view. Thus, the dissimilarity score could conceivably range from 0 to 26.

TABLE 1

MEANS AND STANDARD DEVIATIONS OF ASSUMED DISSIMILARITY SCORES OF HIGH AND LOW PREJUDICED SUBJECTS JUDGING WHITES AND NEGROES

| Subjects | Race of stranger | | | | | |
|---|---|---|---|---|---|---|
| | White | | | Negro | | |
| | *N* | *M* | *SD* | *N* | *M* | *SD* |
| High prejudiced | 12 | 7.08 | 2.90 | 12 | 9.83 | 2.41 |
| Low prejudiced | 15 | 6.67 | 3.57 | 15 | 7.53 | 2.45 |

In Table 1 the means and standard deviations of the assumed dissimilarity scores are shown. When these scores were examined by means of a two-way analysis of variance, as shown in Table 2, the race variable was found to affect assumed dissimilarity to a statistically significant degree. An interaction between prejudice and race was predicted but not obtained. Even though strict statistical logic would preclude further analysis, differences between cells were examined by means of *t* tests. It was found that high prejudiced subjects assumed greater dissimilarity between themselves and a Negro stranger than between themselves and a white stranger ($t = 2.41$, $df = 22$, $p < .05$); they also assumed greater dissimilarity between themselves and a Negro than did the low prejudiced subjects ($t = 2.15$, $df = 25$, $p < .05$). For low prejudiced subjects, the assumed dissimilarity scores for whites and Negroes did not differ to a statistically significant degree. Thus, the hypotheses were confirmed, but only by virtue of ignoring the lack of significance of the interaction *F*. Obviously, replication is indicated.

If the obtained results are replicable ones, interpretations other than our specific hypothesis might be offered. It is possible, for

TABLE 2

ANALYSIS OF VARIANCE OF ASSUMED DISSIMILARITY SCORES OF HIGH AND LOW PREJUDICED SUBJECTS JUDGING WHITES AND NEGROES

| Source | *df* | *MS* | *F* |
|---|---|---|---|
| Prejudice | 1 | 24.60 | 2.72 |
| Race | 1 | 39.18 | 4.34* |
| Interaction | 1 | 11.83 | 1.31 |
| Within | 50 | 9.03 | |

* $p < .05$.

example, that the assumed dissimilarity is in terms of stereotypes held by the high prejudiced subjects. The reported differences might simply reflect differences in the extent to which the two groups of subjects accept and express stereotyped beliefs about Negroes. One factor which would act against stereotyping is the nature of the attitude items; they do not seem to reflect common elements in the Negro stereotype. Nevertheless, on each of the 26 items, high and low prejudiced subjects were compared with respect to the attitudes they ascribed to the depicted Negroes. Not one of the 26 chi square analyses revealed statistically significant differences. Thus, the findings do not appear to be the result of generally held stereotypes but rather of individually assumed dissimilarities. For example, in the high prejudiced group, seven subjects indicated that they were in favor of smoking; of these, four guessed that the Negro in the photograph was against it. Of the five high prejudiced subjects who were against smoking, three assumed that the Negro in the photograph favored it. While the low prejudiced subjects were similar to the high prejudiced ones in their own attitudes about smoking, only four of them assumed that the Negro in the photograph disagreed with them.

Still another possibility was that the dissimilarity assumed by the high prejudiced students was the result of realistic evaluations on their part. Perhaps their attitudes on the various issues actually are more different from Negroes than from whites, and perhaps such differences do not characterize those low in prejudice. That is, rather than prejudice leading to assumed dissimilarity, it is possible that actual dissimilarity leads to prejudice.

Two types of evidence seem to argue against this second alternative hypothesis. First, when the opinions of the 30 low prejudiced and 24 high prejudiced individuals are compared, they are found to differ significantly from one another on only 2 of the 26 attitudes. As would be expected, they differ on an item dealing with school integration ($\chi^2 = 26.70$, $df = 1$, $p < .001$). Also, the low prejudiced individuals are more in favor of the use of birth control techniques ($\chi^2 = 4.20$, $df = 1$, $p < .05$); perhaps religious affiliation could account for this difference. For the other 24 issues, scores on the Desegregation Scale were unrelated. Since there is little difference between the two groups of subjects, it is not likely that the high prejudiced differ more from Negroes than do the low prejudiced. Nevertheless, a second bit of evidence was obtained. A group of 27 Negro students and a group of 27 white students were given the Survey of Attitudes. Then, the attitude scales of the high and low prejudiced subjects in Experiment I were paired randomly with scales actually filled out by these white and Negro strangers. The question here is whether actual dissimilarity scores vary as a function of prejudice of subject and race of stranger.

TABLE 3

MEANS AND STANDARD DEVIATIONS OF ACTUAL DISSIMILARITY SCORES OF HIGH AND LOW PREJUDICED SUBJECTS RANDOMLY PAIRED WITH WHITES AND NEGROES

| Subjects | Race of other | | | | | |
|---|---|---|---|---|---|---|
| | White | | | Negro | | |
| | *N* | *M* | *SD* | *N* | *M* | *SD* |
| High prejudiced | 12 | 8.83 | 2.44 | 12 | 8.08 | 1.98 |
| Low prejudiced | 15 | 8.33 | 1.66 | 15 | 8.20 | 2.07 |

In Table 3, the means and standard deviations of the actual dissimilarity scores are shown. It can be seen that there is little variation in the actual dissimilarity of attitudes of randomly matched strangers, irrespective of race and racial prejudice. In an analysis of variance, neither the main effects nor the interaction were statistically significant.

These results may be taken to support the interpretation offered previously. One of the concomitants of racial prejudice seems to be an unwarranted assumption of dissimilarity with respect to members of the target group.

## EXPERIMENT II: RACIAL PREJUDICE VERSUS ATTITUDE SIMILARITY

### *Background*

It has been proposed (Newcomb, 1956) that attraction between two individuals is a

function of the extent to which reciprocal rewards are present in their interaction and (Byrne, 1961a) that dislike is a function of reciprocal punishments. Attraction toward any given individual at a point in time is probably determined by the relative number and the relative intensity of rewards and punishments associated with him. Each behavior unit which occurs during an interaction sequence may be classified as rewarding, neutral, or punishing. Examples of rewarding interaction include the giving of money, praise, or sexual gratification. Neutral interactions include mutual engagement in the rituals of a common culture, the verbalization of cliches, and various routine interpersonal transactions. Punishing interactions include the making of hostile remarks, the administration of physical pain, and the creation of frustrating conditions. With success and failure experiences serving as rewards and punishments, it has been found that interpersonal attraction toward fellow group members varies directly with rewards administered by one of those members (Kleiner, 1960) and with rewards administered by the experimenter (Lott & Lott, 1960).

The expression of disagreement by another person can be conceptualized as a punishing event and the expression of agreement as a rewarding one (Byrne, 1961b). Briefly, such communications constitute consensual invalidation and consensual validation, respectively. Thus, our learned drives to be logical and to be accurate in interpreting the world are either frustrated or reinforced. In a number of studies, attraction has been found to vary as a function of attitude similarity (Byrne, 1961a, 1961b; Jones & Daugherty, 1959; Smith, 1957). It seems clear that most people tend to like those who hold attitudes similar to their own and to dislike those who hold dissimilar attitudes.

In spite of the large number of prejudice studies which have been conducted over the past half century, the interaction between race and racial prejudice has received scant attention in studies of interpersonal attraction. However, several investigators have reported that whites in general are more attracted to other whites than to Negroes in making various types of sociometric choices. Friendship choices on the basis of race have been reported among school children (Koch, 1946), graduate students (Mann, 1958), and infantrymen (Berkun & Meeland, 1958).

In the Wong (1961) study, high prejudiced individuals were found to respond more negatively to an unknown Negro than to an unknown white. In Experiment I, those high on the prejudice scale were found to assume greater dissimilarity between themselves and an unknown Negro than between themselves and an unknown white. Thus, symmetrical A-B-X relationships are achieved. What would happen though, if this symmetry were disturbed by confronting a highly prejudiced subject with information indicating a high degree of similarity of attitudes between himself and a Negro? And, what happens when a subject low in prejudice is confronted by a Negro with attitudes dissimilar from his own?

Rokeach, Smith, and Evans (1960) asked subjects to indicate their feelings about abstract individuals who varied with respect to race and beliefs. They found that belief congruence was more important than racial congruence in determining preferences. In a similar experiment, Triandis (1961) found that while race and belief system both determine social distance, race is a more important determinant of prejudice.

In the present experiment, attitude similarity, race, and racial prejudice are investigated jointly. The major focus of interest, however, is on those experimental groups in which the two classes of variables exert conflicting influences. Nonsymmetrical A-B-X conditions are created, but no specific predictions are made as to the type of changes: whether prejudice or attitude similarity will predominate in determining attraction ratings or whether a compromise solution is more likely.

### *Procedure*

A new group consisting of 120 introductory psychology students (59 males, 61 females) was employed in this experiment. Initially, two different experimenters gave 166 subjects the Desegregation Scale and the Survey of Attitudes. On the basis of scores on the D scale, two groups of subjects were formed: 60 high prejudiced (scores of 48–95) and 60 low prejudiced (scores of 9–47).

Several weeks later they took part in the second portion of the experiment. The experimenter who administered the attitude survey informed the subjects that he was conducting a study of interpersonal prediction. Previous work was described in which it was reportedly shown that students could accurately evalute others on the basis of limited information about their attitudes. The subjects were told that some of the strangers were at the University of Texas and some at other nearby institutions, including a Negro college in Austin. They were asked first to read carefully the background information (including race) about the other person and then to examine his attitudes. Two scales of the Interpersonal Judgment Scale, which follow, were used to measure the dependent variables:

Personal Feelings (check one)

—— I feel that I would probably like this person very much.
—— I feel that I would probably like this person.
—— I feel that I would probably like this person to a slight degree.
—— I feel that I would probably neither particularly like nor particularly dislike this person.
—— I feel that I would probably dislike this person to a slight degree.
—— I feel that I would probably dislike this person.
—— I feel that I would probably dislike this person very much.

Working Together in an Experiment (check one)

—— I believe that I would very much dislike working with this person in an experiment.
—— I believe that I would dislike working with this person in an experiment.
—— I believe that I would dislike working with this person in an experiment to a slight degree.
—— I believe that I would neither particularly dislike nor particularly enjoy working with this person in an experiment.
—— I believe that I would enjoy working with this person in an experiment to a slight degree.
—— I believe that I would enjoy working with this person in an experiment.
—— I believe that I would very much enjoy working with this person in an experiment.

The scores on the attitude scales which they examined were fabricated by the experimenter. Half of each subgroup received scales on which the stranger agreed with them completely with respect to direction of opinion on each issue, and half received scales which expressed disagreement with them with respect to direction of opinion on all issues. The agreeing and disagreeing strangers were further subdivided into half whose race was indicated as Negro and half as white. Eight subgroups were thus formed, with 15 subjects in each.

### *Results and Discussion*

Table 4 contains the means and standard deviations of the attraction ratings given in each subgroup. To test overall effects of the three variables on interpersonal attraction, a three-way analysis of variance [3] was computed for each dependent variable. The results are shown in Table 5. It is clear that the major source of variance is the attitude similarity variable. As has been found previously, a stranger with attitudes similar to those of the

[3] For each of the analyses of variance reported in this paper, Hartley's (1950) maximum $F$ ratio test for heterogeneity of variance was employed. The only statistically significant departure from homogeneity was for the Work Partner variable in Experiment II. In order to obtain acceptably homogeneous variance, the data were transformed into the square of each number. The analysis of this variable reported in Table 5 is based on these transformed data.

TABLE 4

MEANS AND STANDARD DEVIATIONS OF ATTRACTION SCORES TOWARD WHITES AND NEGROES OF HIGH AND LOW PREJUDICED SUBJECTS WITH SIMILAR AND DISSIMILAR ATTITUDES

| | Similar attitudes | | | | Dissimilar attitudes | | | |
|---|---|---|---|---|---|---|---|---|
| | White | | Negro | | White | | Negro | |
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Personal Feelings | | | | | | | | |
| High prejudiced | 6.27 | .68 | 5.93 | .93 | 2.27 | 1.06 | 2.33 | .94 |
| Low prejudiced | 6.47 | .50 | 6.27 | .44 | 2.13 | .62 | 3.07 | 1.00 |
| Work Partner | | | | | | | | |
| High prejudiced | 6.13 | .81 | 5.20 | 1.28 | 2.67 | 1.53 | 3.40 | 1.74 |
| Low prejudiced | 6.60 | .49 | 6.00 | .82 | 2.73 | 1.12 | 3.40 | 1.14 |

TABLE 5

ANALYSES OF VARIANCE OF ATTRACTION SCORES TOWARD WHITES AND NEGROES OF HIGH AND LOW PREJUDICED SUBJECTS WITH SIMILAR AND DISSIMILAR ATTITUDES

| Source | *df* | *MS* | *F* |
|---|---|---|---|
| Personal Feelings | | | |
| Prejudice | 1 | 2.41 | 3.30 |
| Race | 1 | .41 | .56 |
| Attitude | 1 | 429.41 | 588.23** |
| Prejudice-Race | 1 | 1.87 | 2.56 |
| Prejudice-Attitude | 1 | 0.00 | 0.00 |
| Race-Attitude | 1 | 4.40 | 6.03* |
| Triple interaction | 1 | 1.02 | 1.40 |
| Within | 112 | .73 | |
| Work Partner | | | |
| Prejudice | 1 | 229.64 | 2.22 |
| Race | 1 | 104.54 | 1.01 |
| Attitude | 1 | 19,405.64 | 187.24** |
| Prejudice-Race | 1 | 4.03 | .04 |
| Prejudice-Attitude | 1 | 480.00 | 4.63* |
| Race-Attitude | 1 | 1,267.50 | 12.23** |
| Triple interaction | 1 | 22.52 | .22 |
| Within | 112 | 103.64 | |

* $p < .05$.
** $p < .001$.

subject is rated significantly more positive than a stranger with dissimilar attitudes.

The only other significant effects were the interaction of attitude and race on both variables and the interaction of prejudice and race on the Work Partner scale. For both prejudice groups, there is a tendency for agreeing whites to be rated more positively than agreeing Negroes and for disagreeing Negroes to be rated more positively than disagreeing whites. The latter suggests that allowances are being made for the weaknesses of the outgroup. However, in terms of $t$ tests, the only significant racial difference was on the Work Partner variable; agreeing whites are rated as more desirable partners than agreeing Negroes ($t = 3.09$, $df = 58$, $p < .01$). The other three white-Negro comparisons failed to yield significant differences. With respect to the other significant interaction effect, high prejudiced subjects tended to rate agreeing strangers significantly more positively on the Work Partner scale than did low prejudiced subjects ($t = 2.50$, $df = 58$, $p < .02$). High and low prejudiced subjects did not differ significantly in their ratings of disagreeing strangers.

It should be noted that these minor variations deal only with degree of positive and negative reactions; they should not obscure the main findings. That is, regardless of prejudice of subject and race of stranger, similarity of attitudes resulted in positive ratings and dissimilarity of attitudes resulted in negative ratings. Given a limited amount of information about the attitudes of a stranger, high prejudiced subjects tend to rate agreeing Negroes positively while those low in prejudice tend to rate disagreeing Negroes negatively. Within the limits of this experimental design, it would appear that the attitude similarity variable is of greater strength than the prejudice and race variables. The most intriguing finding is that high prejudiced subjects rated a Negro with attitudes similar to their own in a positive way.

## DISCUSSION

In building a theory of interpersonal attraction, the most inclusive independent variable is almost certainly that of reciprocal reward and punishment. Actually, the other three classes of variables appear to be relevant only as they relate to reward and punishment. Propinquity is important in determining attraction because environmental variables can facilitate or inhibit interaction, and without interaction, rewards cannot be given or received. The strong desire to form affiliative relationships suggests that the expectancy of reward in an interpersonal context is high. Similarly, attraction or repulsion based on overt stimulus properties would seem indicative of expectancies for rewards or for punishments in the interaction.

What are the implications of conceptualizing racial prejudice (and the reduction of racial prejudice) in terms of attraction theory?

Probably the least likely origin of anti-Negro prejudice is stimulus generalization on the basis of a personal encounter with a member of that race who administers an interpersonal punishment. It is more likely that prejudiced parents teach their children to expect unpleasant consequences from various types of interracial encounters. In an experimental analogue of such a teaching process, Stagner and Britton (1949) succeeded in creating less favorable attitudes toward Boliv-

ians and Columbians by associating the names of these countries with unpleasant stimuli (electric shock, butyric acid) in two learning experiments. In a similar way, children are the recipients of avoidance conditioning with respect to Negroes. Much of what is taught is probably of a relative ill-defined nature; the most explicit message is that interaction with Negroes will result in the occurrence of unpleasant consequences. The threatened punishment may come from the Negroes themselves ("They'll pull a razor on you when they're mad." "They're dirty and carry diseases." "Watch out for those colored kids.") or from one's own associates ("Nice people don't play with Negroes." "Never bring one into *my* livingroom." "Don't ever get known as a nigger-lover.")

Irrespective of the origins of negative attitudes toward ethnic groups, once established these beliefs tend to perpetuate themselves. However, if prejudiced individuals were provided with experiences in which equal status interactions with Negroes involved interpersonal rewards rather than the expected punishments, their expectancies and hence their prejudiced beliefs should be altered. Enforced contact between the races is one possible way to bring about changed expectancies. Of course, interracial contact situations do not of necessity lead to the reduction of prejudice. For one thing, there are mean and selfish Negroes and even Negroes who have the bad sense to hold dissimilar values and opinions from oneself.

It is hypothesized that interracial contact is effective in reducing prejudice as a function of the frequency of interpersonal rewards which occur in that contact and of the proportion of rewarding interactions in relation to punishing and neutral ones. Without isolating the reward variables, several studies have nevertheless found that equal status contacts with Negroes resulted in more positive interracial attitudes among housewives dwelling in federal housing projects (Deutsch & Collins, 1951; Wilner, Walkley, & Cook, 1952), students participating in a special seminar experience (Smith, 1943), graduate students in leaderless discussion groups (Mann, 1959), officers and enlisted men in infantry platoons (United States War Department, 1947), merchant seamen (Brophy, 1956), and workers in various settings (Gundlach, 1956; Palmore, 1955). Other explanations which have been advanced to account for these findings include the breaking down of stereotypes by inconsistent experiences (Deutsch & Collins, 1951; MacKenzie, 1948; Smith, 1943; Wilner et al., 1952), the overcoming of social distance (Smith, 1943), the sharing of traumatic experiences (Brophy, 1956), and conformity to official sanctions (Deutsch & Collins, 1951; Gundlach, 1956; Wilner et al., 1952).

It would seem that the proposition that prejudice is reduced by interpersonal rewards incorporates these various interpretations. In the contact studies, most of the rewards probably involved Negroes directly. Perhaps an example of one type of such reward was present in Experiment II. Most of the high prejudiced subjects indicated quite positive feelings toward an unknown Negro who agreed with them. In reading through the Survey of Attitudes, each subject received 26 rewards from this stranger via consensual validation. As a consequence, at least for a limited period of time and with respect to a specific Negro, racial prejudice was diminished. Subjects with high scores on the D scale said that they liked and would enjoy working with a Negro stranger. In addition, they wrote such spontaneous comments as "more power to him" and "Negroes like him can make integration work." In the contact studies, rewards from Negroes involve not only the discovery of similar attitudes about various issues, but, for example, a Negro housewife cooking soup for a sick neighbor (Deutsch & Collins, 1951) and a Negro employee obtaining union benefits for his coworkers (Palmore, 1955). The other major source of reward was undoubtedly the expression of explicit and implicit approval of positive interracial behavior by other whites, including those in positions of authority. As the cumulative frequency of each type of reward increased, racial prejudice decreased.

If the general conceptions presented here are accurate, it should be possible to alter negative interracial attitudes through more direct and efficient means than the uncontrolled interactions in contact situations. Any situation in which Negroes or whites administer rewards to one another or in which

Negro-white interaction is rewarded by others should be effective in fostering positive interracial attitudes.

## SUMMARY

This investigation was undertaken in order (*a*) to test hypotheses dealing with assumed attitude dissimilarity as a function of racial prejudice and (*b*) to explore the interactive effects of race, racial prejudice, and attitude similarity-dissimilarity in determining interpersonal attraction.

In the first experiment, highly prejudiced subjects were found to assume greater attitude dissimilarity between themselves and a Negro stranger than between themselves and a white stranger; for subjects low in prejudice the assumed dissimilarity scores for whites and Negroes did not differ. In the second experiment, similarity of attitudes resulted in positive ratings and dissimilarity of attitudes resulted in negative ratings, regardless of the prejudice of the subjects or the race of the stranger.

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# ETHNOCENTRISM AND THE ACCEPTANCE OF NEGRO SUPPORT IN A GROUP PRESSURE SITUATION [1]

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This study was designed to determine whether or not a highly prejudiced person would accept the support of a Negro in a group pressure situation that produces conflict and self-doubt. Persons high and low in prejudice, as measured by the California E Scale, were placed in group situations in which the effects of prejudice on conformity, and on the acceptance of social support from Negro and white partners could be studied. Use was made of the Asch (1951) line judging procedure, which is interpreted as setting up contradictory pressures between an individual's perceptual experience and social consensus. Each experimental group was composed of one critical subject who was white and five confederates, of whom four were white and one was Negro. After being confronted for some time with a contrary majority of five, the critical subject was given support either by the Negro or a white confederate.

The original conception of ethnocentric ideology (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950) leads to the prediction that highly prejudiced individuals will manifest more conformity behavior than low prejudiced individuals. The highly ethnocentric person is characterized as one who idealizes and is submissive to ingroup standards. In addition, the E Scale contains some acquiescence variance as well as content variance (Chapman & Campbell, 1959), and it is therefore further expected that a person scoring high on the E Scale will be more susceptible to influence attempts than one scoring low. Since Asch (1951) has found that the amount of yielding to an objectively incorrect majority decreases when the minority subject is supported in his judgments by one group member, lessened conformity may also, then, be expected of a highly ethnocentric subject, but only when he is joined by a white partner and not by a Negro. The ethnocentric individual, with his strong negative, stereotyped views of Negroes, should reject the support of a Negro group member and show no significant decrease in conformity responses.

The hypotheses tested in the present investigation are derived from the general position of Adorno et al. (1950) but also provide a test of another set of propositions. The work of Rokeach (1960) suggests that racial prejudice is a special case of a more general belief prejudice. In other words, people do not reject other people primarily on the basis of race or ethnic categories, but rather "in terms of how congruent or incongruent others' belief systems are" to their own. By systematically pitting belief characteristics of people against their ethnic characteristics, Rokeach has shown that preference or rejection of others, by southerners as well as northerners, is influenced more by belief similarity and dissimilarity than by race. Applying these findings to the present problem, highly prejudiced persons would not be expected to differ from low prejudiced persons in accepting social support from a Negro as readily as from a white partner. If the Asch (1951) situation may be considered as one which violates a critical subject's belief in the veridicality of his own perception of simple stimuli, he should, according to Rokeach, accept the support of anyone who sees things his way and the racial characteristics of the supporting person should be of secondary importance.

A third approach which attempts to predict the behavior of prejudiced individuals is that of Pettigrew (1961) who has emphasized the importance of the situation in understanding interracial behavior and has suggested that, for predictions in this area, the concept of social adjustment may be more useful than personality variables. He maintains that most

[1] This paper is based upon the first author's thesis for the Master of Arts degree at the University of Kentucky.

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individuals will shift their responses in an interracial situation to conform to the demands of that situation, which include the norms of the community. The situation resistant, or defiant, individual is the one who holds extreme racial attitudes and the one for whom these attitudes are highly salient. Most persons, however, will be situation bound and behave in accord with prevailing custom. It is difficult to derive explicit predictions from the Pettigrew formulation with respect to the present experimental situation primarily because it is not clear whether the situation resistant individual can be detected by high scores on the E Scale, or by means of depth interviews, or whether he can only be identified when his behavior is consistent over a number of different interracial situations.

The specific hypotheses tested in the present study, based on the personality oriented (Adorno et al., 1950) approach to ethnocentrism, are as follows:

*Hypothesis 1.* When placed in a social pressure situation, highly prejudiced persons will conform more than persons low in prejudice.

*Hypothesis 2.* If an individual low in prejudice is offered social support in such a situation by one other member of the group, such support will be accepted as readily from a white as from a Negro partner.

*Hypothesis 3.* An individual high in prejudice will accept support from a white group member but will reject it from a Negro. Acceptance of support is defined by a decrease in conformity to the inaccurate judgments of the majority, while rejection of support is defined by no change in such conformity behavior.

## METHOD

### *Subjects*

Sixty white males from classes in introductory psychology at the University of Kentucky served as critical subjects. In the experiment proper, each was a member of a six-person group formed for the purpose of the study. Forty-one white males from the same classes and six Negro males from other classes voluntarily aided the investigators by participating in the groups as confederates.

### *Procedure and Materials*

A week or more prior to the experimental situation, the E Scale was administered to all introductory psychology students by laboratory assistants. The experimenter was not linked with this procedure in any way. A mean total ethnocentrism score and a mean Negro ethnocentrism score (based on the six Negro items only) were computed for each subject. Thirty subjects who were highly prejudiced, i.e., who had high general E scores and high Negro E scores were then selected. The mean item score [3] for these subjects, on both scales, ranged from 5.1 to 7.0, the maximum score possible. For this group as a whole, the mean E score was 5.04, the mean Negro E score was 5.54. Thirty other subjects, low in both general and Negro prejudice, were also selected. These subjects scored from 3.0 to 1.0, the lowest possible score, on both scales. Group means were 2.37 and 1.67 on the general E and Negro E scales, respectively.

Four experimental conditions, with 15 critical subjects in each, were: High E-Negro partner, High E-white partner, Low E-Negro partner, and Low E-white partner. In one condition, a Negro partner (confederate) broke away from the majority in the middle of the experiment and began announcing correct estimates of the line stimuli; in the second condition, the partner playing this role was one of the white confederates.

The experimental task, materials, and instructions were taken from Asch (1956). When a subject arrived at the place of the experiment, he found some or all of the confederates ostensibly waiting for the experiment to begin. When everyone was present, the experimenter asked the group to take seats at a table in the order that their names had been called. The experimenter explained that the seating order was randomized to insure that each person had an equal opportunity to sit in any seat. The critical subject always occupied the sixth seat. The "partner's" position was randomized among the second, third, fourth, and fifth seats. After the experimenter read the instructions, some confederates asked clarifying questions to enhance the impression that they were new to the situation. The partner was Negro or white depending upon the experimental condition.

When the session was over, the critical subject was interviewed. Five questions were asked, designed to determine whether or not the subject knew the situation was rigged and if he was aware of the presence of a "partner." All subjects said they were aware that one group member shared their judgments during the last part of the experiment. A replacement was obtained for one subject who detected the nature of the deception.

The measure of conformity utilized was simply the number of responses which a critical subject made, with or without a partner, which were incorrect, and either in agreement with the incorrect judgment made by the majority or a "compromise" judgment (choice

[3] Six response categories were utilized which were scored 7, 6, 5, 3, 2, 1 according to whether a subject strongly agreed, moderately agreed, slightly agreed, slightly disagreed, moderately disagreed, or strongly disagreed, respectively. If an item was not answered it received a score of 4.

of the intermediate line). All subjects made 18 line judgments without a partner and 18 with a partner. Twelve in each instance were critical trials where the unanimous majority gave an incorrect judgment. On the other 6 trials, which were interspersed among the critical trials, the majority gave correct judgments.

## RESULTS

The range of conformity responses (raw scores) for the High E subjects, combining those in the Negro, and white, partner conditions, was from 0 to 12, while that for the Low E subjects, similarly combined, was 0 to 4. The maximum score possible was 12 since 12 trials were given without a partner and with incorrect majority judgments. These scores were analyzed by means of the median test (Siegel, 1956). The relevant data are given in Table 1. The resultant chi square was found to be 16.3 ($p < .001$), indicating that the High E subjects made significantly more conformity responses in the face of a unanimous majority than did Low E subjects, which confirms the first hypothesis.

Prior to testing the second and third hypotheses, relative to the acceptance of Negro and white partners by Low and High E subjects, a check was made to see whether the two Low E groups, and the two High E groups, had the same initial levels of conformity. Table 1 presents the conformity scores for the two groups within each of the ethnocentrism levels. Using Fisher's exact probability test (Siegel, 1956), with each distribution divided at the median (3.0 for the High E and 0 for the Low E groups), the probability that the two Low groups are different was found to be .10 (two-tailed) and that the two High groups are different, .38 (two-tailed). It is concluded, therefore, that between the two Low E groups and between the two High E groups there were no significant differences in conformity behavior prior to the entry of a partner into the situation.

TABLE 1

CONFORMITY RESPONSES OF CRITICAL SUBJECTS BEFORE OBTAINING A PARTNER'S SUPPORT

| Experimental condition | Number of subjects at or below median[a] | Number of subjects above median | N |
|---|---|---|---|
| Low E | 25 | 5 | 30 |
| High E | 9 | 21 | 30 |
| | $\chi^2 = 16.3$, $p < .001$ | | |
| Low E-white partner | 11 | 4 | 15 |
| Low E-Negro partner | 14 | 1 | 15 |
| | Fisher's exact test, $p = .10$ | | |
| High E-white partner | 5 | 10 | 15 |
| High E-Negro partner | 4 | 11 | 15 |
| | Fisher's exact test, $p = .38$ | | |

[a] Median number of conformity responses for Low E and High E subjects combined = 1.0, for Low E subjects = 0, and for High E subjects = 3.0.

TABLE 2

CONFORMITY RESPONSES OF CRITICAL SUBJECTS AFTER OBTAINING A PARTNER'S SUPPORT

| Experimental condition | Number of subjects at or below median[a] | Number of subjects above median | N |
|---|---|---|---|
| Low E-white partner | 10 | 5 | 15 |
| Low E-Negro partner | 12 | 3 | 15 |
| | Fisher's exact test, $p = .46$ | | |
| High E-white partner | 12 | 3 | 15 |
| High E-Negro partner | 7 | 8 | 15 |
| | Fisher's exact test, $p = .10$ | | |

[a] Median number of conformity responses for Low E subjects = 0; that for High E subjects = 0.

The second hypothesis predicted that an individual low in prejudice would accept support from a Negro as readily as from a white partner. Fisher's exact probability test was utilized to compare the yielding scores of the Lows with white partners with the yielding scores of the Lows with Negro partners for the 12 critical trials on which correct judgments were made by a partner. The number of scores above and below the median made by subjects in each of the two groups is given in Table 2. The difference was found not to be significant ($p = .46$), thus supporting the hypothesis.

The third hypothesis, that a highly prejudiced subject will accept support from a white partner, but reject it from a Negro was also tested by use of the exact probability test. Dividing the conformity score distribution at the median, the High E subjects who were offered support by a white partner were compared with the High E subjects who were offered support by a Negro partner. These data are shown in Table 2. Since the probability that the scores of these two groups were different was found to be .10, the null hypothesis cannot be rejected. This finding is contrary to our prediction. It can be seen from Table 2, however, that, although the differ-

TABLE 3

CHANGE IN CONFORMITY BEHAVIOR OF HIGH E SUBJECTS FROM THE CONDITION OF NO PARTNER TO THE CONDITION OF PARTNER PRESENT

| Experimental condition | Number of subjects who conformed less with partner present | Number of subjects who conformed more with partner present | Number of subjects who did not change with partner present | *N* |
|---|---|---|---|---|
| High E-white partner | 13 | 0 | 2 | 15 |
| High E-Negro partner | 10 | 0 | 5 | 15 |

ence was not a significant one, there were more High E subjects who made zero conformity responses with a white partner than with a Negro partner. Two additional analyses were therefore performed. For both of the High E groups conformity behavior in the condition of no partner was compared with that in the condition of partner present, by means of the Wilcoxon matched-pairs signed-ranks test (Siegel, 1956). In both cases the obtained $T$ was equal to 0 ($p < .01$, two-tailed) indicating that there was a significant drop in number of conformity responses for the High E subjects as they went from a situation where they were opposed by a unanimous majority to one where they were supported by one other member of the group, regardless of his race. The number of white partner and Negro partner subjects who decreased, increased, or made the same number of conformity responses with a partner as they had without one are shown in Table 3.

## DISCUSSION

The greater amount of conformity in a group pressure situation which was found true of high ethnocentric as compared with low ethnocentric subjects supports our first hypothesis and the basic notion that the ethnocentric person will obey ingroup "requirements" and submit to ingroup standards. That he appears to perceive even a contrived ingroup as superior in judgment ability and worthy of following is an indication of the extent to which he will idealize and be influenced by ingroup pressures generally. The greater amount of conformity of the high ethnocentric person may also be interpreted as a behavioral indication of an acquiescence factor that appears to be associated with the measurement of ethnocentrism.

The low prejudiced subjects behaved as was expected, both in conforming less than high prejudiced subjects initially when faced with an incorrect unanimous majority, and then in reducing this conformity when joined by either a white or Negro partner. The latter finding supports Hypothesis 2.

The highly prejudiced subjects also accepted the support of both Negro and white partners. This finding contradicts the third hypothesis and thus tends to question the adequacy of the Adorno et al. (1950) framework from which the prediction stemmed. The results obtained on the High E subjects fit more neatly into the Rokeach (1960) approach to interracial behavior in which belief congruence is regarded as a more important determiner of the acceptance of others than racial or ethnic characteristics. Thus highly prejudiced subjects would have been expected to accept the suport of a Negro partner, as they did, when the Negro provided agreement for perceptual judgments.

The clear, but nonsignificant, trend in the direction of greater acceptance of the white partner than the Negro partner by the highly prejudiced subjects, is consistent with the Adorno et al. (1950) approach but can also be explained by Rokeach (1960). He found that, when belief is held constant, white subjects tend to prefer their own racial group to the Negro group. Although belief similarity is the most important criterion of acceptance, when both a Negro and a white person agree with a white individual there is a clear tendency for the white person to be accepted more than the Negro.

What implications do the results of the present study have for Pettigrew's (1961) position? They suggest that a high score on the E Scale will not identify a prejudiced person who is situation resistant. What is needed is a set of operations by means of which such

an individual may be detected other than by observing his behavior in interracial situations. It is possible that there are few persons who will overtly exhibit prejudice in the face of contrary situational pressures and that these are persons whose prejudice is part of a more general pathology.

The present investigation supports the frequently noted phenomenon that prediction of behavior from elicited verbal attitudes will not be successful without some consideration of the situation in which the behavior will take place. Verbal attitudes may be good predictors of other elicited verbal attitudes as has been shown, for example, by Greenberg (1961), who found a significant positive correlation between the E Scale and an integration attitude scale. However, when a behavioral expression of an attitude is called for, the situational characteristics seem to assume great importance in determining how the attitude will, in fact, be expressed. The present study indicates that known prejudicial attitudes do not provide adequate grounds for making accurate behavioral predictions in certain interracial situations.

## SUMMARY

Highly prejudiced individuals and other individuals low in prejudice, as measured by the California E Scale, served as critical subjects in an experiment utilizing the Asch (1951) line judging task. After being opposed by a unanimous majority for some time, subjects received support of either a Negro or white confederate. Predictions, based on the Adorno et al. (1950) conception of ethnocentric ideology, were that: (*a*) when faced with an opposed unanimous majority, high ethnocentric subjects would manifest more conformity behavior than low E subjects; (*b*) low E subjects would accept support equally from a white or Negro confederate; (*c*) high E subjects would accept support from a white but not a Negro confederate.

The first two predictions were confirmed but high ethnocentric subjects were also found to accept significant amounts of support from Negro, as well as white, confederates. Acceptance of support is defined as a decrease in conformity responses with the partner present.

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# THE INFLUENCE OF SELF–ESTEEM ON RATE OF VERBAL CONDITIONING AND SOCIAL MATCHING BEHAVIOR[1]

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Recent years have witnessed an increasing interest in determining personality correlates of responsiveness to social influence processes. One variable which has received a good deal of research attention has been self-esteem, typically defined as a person's characteristic evaluations of himself and his accomplishments. Low self-esteem is characterized by feelings of personal inadequacy, guilt, shyness, and social inhibitions; high esteem reflects feelings of self-confidence and satisfaction (Hovland, Janis, & Kelley, 1953).

A person's characteristic self-esteem is believed to be a function of his reinforcement history (Cohen, 1959; Lesser & Abelson, 1959; Sears, 1942). The high esteem individual has presumably had a past history of chiefly positive reinforcement for his efforts, while a low esteem person has met with negative reinforcement in a variety of situations. It has been hypothesized that self-esteem is negatively related to social suggestibility on the assumption that low self-esteem and high persuasibility stem from the same type of previous experience, i.e., negatively reinforced instances of disagreement or discrepancy (Lesser & Abelson, 1959). Research done to date generally provides support for this theory (Hovland & Janis, 1959).

Since investigators interested in self-esteem have primarily been social psychologists, persuasibility measures such as opinion change (Janis & Field, 1959) and matching behavior (Abelson & Lesser, 1959) have been extensively studied. However, other measures usually employed by experimental psychologists (e.g., verbal learning) have not been investigated as they might relate to persuasibility and self-esteem. Furthermore, except for one or two studies (deCharms & Rosenbaum, 1960), measures of self-esteem have been largely response inferred (e.g., global ratings or personality questionnaires) rather than experimentally manipulated.

The purpose of the present study was to investigate the effects of both response inferred and of experimentally manipulated self-esteem upon social suggestibility as measured by a picture preference test involving matching behavior, and a measure traditionally used more by experimental psychologists, verbal operant conditioning. Children were assigned to high and low self-esteem groups on the basis of their scores on a self-concept questionnaire, and equal numbers of subjects from each group were then exposed either to a success or a failure experience designed to manipulate self-esteem. Following the esteem manipulation, subjects participated in a picture preference task with an experimental confederate and the subjects' tendency to match the behavior of the confederate was measured. Finally, subjects were administered a verbal conditioning task in which their responsivity to the experimenter's verbal reinforcement was measured.

Experimental hypotheses were derived from the theory proposed by Hovland, Janis, and their associates, that self-esteem and persuasibility are inversely related. It was predicted that in relation to high self-esteem subjects (high rated esteem subjects who succeeded), subjects low in self-esteem (low rated esteem subjects who failed) would be more inclined to match picture preference choices of the confederate and to condition reinforced verbal responses to a higher level. No predictions were advanced concerning performances of subjects whose experimentally mediated experiences contradicted their customary esteem expectations, i.e., subjects high in rated

[1] This article is based on a dissertation submitted to the Department of Psychology of Stanford University in partial fulfillment of the requirements for the PhD degree.

[2] The author is greatly indebted to Albert Bandura for his advice and assistance in carrying out this research and in preparation of the manuscript for publication.

esteem who failed and subjects low in rated esteem who succeeded.

## METHOD

### *Subjects*

Subjects were 60 fifth grade, public school children, 30 of whom were males and 30 females. Sixty additional children served as experimental confederates. Since there is some evidence that females are generally more persuasible than males (Hovland & Janis, 1959), subjects of both sexes were included in the study to check this finding.

### *Design and Procedure*

A $3 \times 2$ factorial design was used with two levels of self-esteem (high and low) and three experimental conditions (success, failure, and control). Subjects were first administered a self-concept test developed by Sears (1960). The test consisted of 100 questionnaire items covering 10 different areas of competence presumed important in children's self-evaluations. Subjects were asked to rate their ability on a five-point scale on each item. Self-esteem scores were the average of the subjects' self-ratings over the 100 items. On the basis of their test scores, subjects were dichotomized at the median into high and low self-esteem groups. One-third of each group was then randomly assigned to an experimental success manipulation designed to heighten self-esteem, one-third to a failure condition designed to lower self-esteem, while one-third constituted the control group which did not experience the experimental manipulations.

### *Experimental Manipulations*

*Failure Condition.* Subjects were run in pairs in which one served as the experimental subject, while the other acted as an unwitting confederate. Subjects participated in four tasks in which the experimenter controlled results so that the confederate's performance was consistently better than the subject's.

The first task consisted of a 261-item arithmetic test involving addition, subtraction, and multiplication subtests, and was presented as a test of "arithmetic reasoning ability." In order to heighten the apparent importance of the test, it was prominently labeled Standard Arithmetic Reasoning Ability Test. Subjects were allowed 3 minutes to work on each subtest, and after 9 minutes, the experimenter ostensibly scored the tests and reported that the confederate completed twice as many problems correctly as did the subject. To emphasize further the success of the confederate, subjects were asked to record each other's scores on all tasks.

For the second task, subjects were asked to participate in a "test of physical power." Test apparatus consisted of a large, black box ($16'' \times 17'' \times 23''$) with a stirrup-type handle anchored on one side, a meter on another side, and a cord by which the experimenter could control the meter reading on a third side. The subject and the confederate were asked to take two turns each; while the subject was pulling, the confederate called out the meter reading and vice versa. Players received tied scores on this task because pretesting showed that having the confederate best on all four tasks made many subjects withdrawn or unduly upset.

The third task involved the use of materials from the Wisconsin Card Sort materials and was presented as a test of "problem solving ability." The task was arranged so the subject and the confederate could not see each other's sorts nor could they determine the correct criteria. Subjects were asked to sort the cards twice, and each time the confederate apparently achieved the solution much more quickly than did the subject.

The final task was a test of "hand-eye coordination." The equipment consisted of a miniature bowling alley ($36'' \times 12'' \times 6''$) with a runway at the end of which were three upright, doweled targets. The target area was screened from view by a fiberboard shield so the players had no way of knowing whether or not they struck a target. As a sign to the subjects that they had hit a target, a doweled marker dropped. The targets, however, were controlled with strings by the experimenter who was positioned at the side of the apparatus. The confederate and the subject each had two turns at bowling, and the confederate again won, receiving twice as high a score as the subject.

To further emphasize the differences in ability between the confederate and the subject, the experimenter instructed them to total scores obtained on all four tasks in order to establish the winner. The experimenter then congratulated the confederate on being the winner. For a detailed discussion of instruction and procedure see Gelfand (1961).

*Success and Control Conditions.* Experimental procedures in the success condition were identical to those described above, except the subject rather than the confederate was the successful partner. Control group subjects did not participate in experimental manipulations, performing only the two criterion tasks.

### *Dependent Variables*

Two different criterion tasks were employed in this study. The first was a picture preference test consisting of 20 pairs of pictures representing a wide variety of subject matter and mounted on $11'' \times 14''$ white cardboard cards. A large pool of pictures was pretested on 60 fifth grade children and pairs of pictures were selected in which one picture was preferred by a three-to-one margin. The confederate was previously informed that this was actually a test to see whether children would follow a leader and that he would serve as leader. The confederate had first choice on each item and was asked to pick the picture the experimenter indicated for each pair. The experimenter held each card by one hand nearest the picture to be chosen. In each case, the confederate chose the picture less preferred by the pretest sample. To increase social pressure on the subject, the

experimenter expressed agreement with the confederate's choices by saying "Good" after the confederate's response on each of the first five items. The score on this test was the number of unpopular pictures chosen by the subject.

Following the picture preference task, the experimenter remarked that the subject and the confederate had worked together on a number of tests and that now they would perform different activities. The confederate was given a neutral task (crossing out letters in a text) while the experimenter administered a modified Taffel (1955) verbal conditioning procedure to the subject. The subject was presented with a series of 100 $3'' \times 5''$ white index cards on each of which was printed a verb in the past tense and the same six pronouns: I, We, He, You, She, and They. The subject was instructed to choose one of the pronouns on each card and say it aloud together with the verb.

The first block of 20 trials was used as a measure of operant level, and no reinforcement was given. For the following four blocks of 20 items each, the experimenter reinforced the subject's use of We and They with approving remarks such as, "That's a good one" or "Good one." The score on the conditioning series was the difference in number of We and They responses produced between operant level and the fourth reinforced block.

At the conclusion of the experimental session, the child who had previously experienced failure was given a success experience on the coordination task to heighten his feelings of self-esteem and thus counteract the reaction induced by the experimental failure condition.

## RESULTS

### *Effectiveness of Esteem Manipulation*

As a check on the effectiveness of the esteem manipulation, subjects rated their performance before and after each task on a five-point rating scale ranging from 1—Very good to 5—Not very good. A median test (Siegel, 1956, p. 111) revealed no significant differences in initial self-ratings between Success and Failure groups ($\chi^2 = 0.05$, $p > .05$), but differences between groups were highly significant on final ratings ($\chi^2 = 25.83$, $p < .001$). The results clearly indicate that the experimental manipulations were successful in altering self-esteem so that subjects in the Success group rated themselves more favorably while subjects who failed evaluated themselves less favorably.

Additional evidence concerning the effectiveness of the esteem manipulations was provided by a check list completed by the experimenter on the subjects' behavior during the conditioning task. Subjects were rated on "anxiety" versus "confidence" behaviors. Behavior considered indicative of anxiety included speech regression, manual-oral contact, frequent sighing, reduction in response speed, drop in voice level, etc. Confident behavior included speaking in a loud, clear voice, increased speed in responding, and absence of fidgeting. In contrast to the High esteem-Success group which displayed 1 anxiety sign and 18 confidence signs, the Low esteem-Failure group yielded 18 anxiety and 5 confidence signs. Although these data were not analyzed statistically, it seems apparent that the Low esteem-Failure group exhibited considerably more overt anxiety than did the High esteem-Success or any other treatment group.

### *Matching Behavior on Preference Task*

The first dependent variable measured was the number of imitative responses made by subjects in the picture preference task. Results of an analysis of variance performed on these data are summarized in Table 1. Because a Bartlett's test made on the residual error term indicated significant heterogeneity of variance ($\chi^2 = 59.13$, $df = 5$, $p < .01$), the .01 level of significance was adopted following Lindquist's (1953) recommendation. Variance of preference test scores was greater for Control subjects than for Success or Failure subjects. With this restriction, one main effect, the experimental esteem manipulation, proved significant. Subjects who experienced failure gave significantly more imitative re-

TABLE 1

ANALYSES OF VARIANCE OF NUMBER OF MATCHING RESPONSES AND OF INCREASE IN REINFORCED RESPONSES ON CRITERION TASKS

| Source | *df* | Matching responses | Reinforced responses |
|---|---|---|---|
| | | *F* | *F* |
| Initial self-esteem | 1 | 0.10 | 4.35* |
| Treatment conditions | 2 | 17.29*** | 0.04 |
| Initial esteem × Treatment | 2 | 0.65 | 15.16*** |
| Residual | 54 | (10.76)** | (18.77)** |

* $p < .05$.
** Error *MS*; significant heterogeneity of variance beyond $p = .01$.
*** $p < .001$.

TABLE 2

DUNCAN'S RANGE TESTS OF MEAN NUMBER OF MATCHING RESPONSES AND MEAN INCREASE IN REINFORCED RESPONSES

| Score | Treatment group | | | | | |
|---|---|---|---|---|---|---|
| | Low-Fail | Low-Succeed | Low-Control | High-Fail | High-Succeed | High-Control |
| Matching responses | $9.7_{a}$ | $4.7_{ab}$ | $7.4_{abc}$ | $10.7_{c}$ | $3.6_{a}$ | $8.3_{bc}$ |
| Reinforced responses | $5.0_{ab}$ | $12.2_{c}$ | $7.7_{bc}$ | $9.7_{bc}$ | $1.9_{a}$ | $6.3_{ab}$ |

Note.—Conditioning and picture preference test data were analyzed separately. Within each row, any two means bearing the same subscript are not significantly different at the $p = .01$ level.

sponses than did subjects who experienced success. Neither initial self-esteem nor the interaction between initial and experimentally manipulated esteem significantly affected picture preference scores.

The results of a Duncan's multiple range test (Edwards, 1960) applied to these data are summarized in Table 2. Failure subjects were significantly more persuasible on the picture preference task than were Success subjects regardless of initial esteem level. Also, Control subjects high in self-esteem were more persuasible than were High esteem-Success subjects; a result not vindicated by the analysis of variance.

*Verbal Conditioning Rate*

The second dependent variable measured was the number of reinforced responses produced in the verbal conditioning task. An analysis of variance performed on the 20-trial operant series revealed that the treatment groups did not initially differ significantly in production of the reinforced class of responses. Neither initial esteem ($F = 0.86$, $df = 1/54$), experimental manipulations ($F = 0.20$, $df = 2/54$), nor the interaction ($F = 0.32$, $df = 2/54$) significantly affected operant level of production of We and They responses.

An analysis of variance of the conditioning data is summarized in Table 1. A Bartlett's test indicated significant heterogeneity of variance ($\chi^2 = 14.30$, $df = 5$, $p < .01$); therefore, only $F$ ratios with probability of occurrence beyond the .01 level were accepted as significant. The variance of High esteem-Success subjects' scores was small while variance of scores for Control subjects was considerably larger. With this limitation, only the interaction term proved significant. An analysis of variance applied to a logarithmic transformation of these data to reduce heterogeneity of variance yielded the same results as the analysis of the original scores.

Table 2 shows the results of a Duncan's multiple range test applied to the conditioning data. Initially low esteem subjects who experienced success were significantly more conditionable than were initially low esteem subjects who experienced failure. Conversely, initially high esteem subjects who experienced failure conditioned to a significantly higher degree than did initially high esteem subjects in the Success condition. Control subjects initially low in esteem were significantly more conditionable than were High esteem-Success subjects.

Initial self-esteem was related to conditioning performance in a rather complex fashion. Because of the strong interaction effect between initial esteem and experimental manipulations, correlations between rated esteem and conditioning scores differed among treatment groups. For the Success and Failure groups, product-moment correlation coefficients of $r = -.77$ ($t = -5.12$, $df = 18$, $p < .01$) and $r = .43$ ($t = 2.02$, $df = 18$, $.10 > p > .05$), respectively, were obtained, while the correlation was not significant for Control subjects ($r = .17$, $t = -0.73$, $df = 18$). Only in interaction with experimental manipulations did initial esteem affect conditioning.

Contrary to the majority of previous findings by Hovland, Janis, and their associates (1959), male and female subjects did not differ significantly in their performance on any of the experimental measures.

## DISCUSSION

The significant group differences in persuasibility found in this study partially confirm the Hovland and Janis hypothesis that self-esteem and persuasibility are negatively correlated. An inverse relationship between self-esteem and persuasibility was obtained on both dependent measures, but it was experimentally manipulated esteem which affected scores on the picture preference task while the interaction between rated and manipulated esteem was the variable related to verbal conditioning scores. The High esteem-Success group proved least suggestible on both criterion tasks as predicted, and the high suggestibility of the Low esteem-Failure subjects on the picture preference task also followed prediction. However, the minimal responsivity of the Low esteem-Failure group on the conditioning task clearly contradicted the experimental hypotheses.

Differences in relative persuasibility of groups between the two criterion tasks may have been due to any or all of a number of factors:

1. The persuasion source was a peer, the confederate, in the picture preference task while the experimenter served as persuasive agent in the conditioning situation.

2. The status of the source was varied in the preference task while status remained relatively constant for the experimenter as source.

3. The preference measure was temporally closer to the experimental esteem manipulation than was the conditioning measure.

4. The measures differed in complexity. The subject chose between many alternatives in the conditioning task while only two alternatives existed in the preference test—to follow or not to follow the confederate in making a choice.

The influence of the first three of these factors can only be surmised, but there is some experimental evidence concerning operation of the fourth factor. Several experimenters have reported the finding that high anxiety facilitates learning simple tasks, but interferes with performance on complex tasks (Montague, 1953; Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960; Taylor & Spence, 1952). The experimenters' ratings of subjects' behavior during the conditioning task provide some evidence that treatment groups differed in overt manifestations of anxiety. Groups which displayed moderate amounts of "anxiety" *and* "confidence" behavior (Low esteem-Success and High esteem-Failure) received the highest conditioning scores, while the Low esteem-Failure group which appeared the most anxious scored relatively low in conditioning. Since a high level of anxiety interferes with learning complex tasks (Taylor & Spence, 1952), there is reason to believe that the conditioning performance of the Low esteem-Failure group was affected by their anxiety and tension. Conversely, the high level of performance of Low esteem-Failure subjects on the relatively simple preference task could also be due to their high anxiety which facilitates performance on simple tasks. Although evidence for facilitating and interfering effects of anxiety is mostly indirect in this study, the available data are consistent with this formulation.

A finding of considerable interest is the high responsivity to verbal conditioning of subjects exposed to experiences inconsistent with their customary self-evaluations (High esteem-Failure and Low esteem-Success groups). While there appears to be no ready explanation for these results, one might speculate whether the high rate of conditioning in these groups may reflect the effects of intermittent reinforcement. Since self-esteem is assumed to be a function of past success and failure experiences (Cohen, 1959), subjects in the High esteem-Success group could be viewed as having experienced a very high schedule of positive reinforcement, both previous to and during the experiment. Low esteem-Failure subjects, on the other hand, experienced a very low schedule of reinforcement, or negative reinforcement for their efforts. There is considerable evidence that schedules of partial reinforcement produce high rates of response (Ferster & Skinner, 1957). If it can be assumed that the experiences of the High esteem-Failure and Low esteem-Success subjects constituted a form of partial reinforcement, then the high level of conditioning exhibited by these groups would be expected.

deCharms and Rosenbaum's (1960) findings that rated, but not manipulated self-

esteem was associated with matching behavior are at variance with results of the present study. This discrepancy in findings may be due to differences in potency of experimental manipulations. deCharms and Rosenbaum's esteem manipulation was relatively superficial in nature, in that adult subjects were simply instructed that they were either high or low in leadership potential. In contrast, the manipulations in the present experiment involved several tasks performed by young children who tended to be highly competitive with each other. Since a series of success or failure experiences was involved, the cumulative effects were very powerful. Differences in subjects' ages may also have contributed to the discrepancy in results obtained in the two studies. Adults may be more influenced by internal norms based on an extensive reinforcement history, while children may be more dependent on external feedback concerning the adequacy of their performance.

Finally, the results of the present study may partially explain the finding of Kanfer and Karas (1959) that prior success and failure experiences did not affect verbal conditioning performance. Such negative results might be due to an unassessed interaction effect between initial self-esteem and experimental manipulations. When initial, rated self-esteem is not considered, conditioning data from the present experiment yield results similar to those obtained by Kanfer and Karas. Since success and failure interact with initial self-esteem to affect social suggestibility, it is clear that a study utilizing only one type of esteem measure may produce somewhat misleading results. Therefore both rated and manipulated esteem should be considered in designing future suggestibility studies.

## SUMMARY

The present study was designed to investigate the effects of response inferred and of experimentally manipulated self-esteem upon social suggestibility in children. Experimental hypotheses were derived from Hovland and Janis' (1959) theory that self-esteem and persuasibility are inversely related.

A personality inventory measure of self-esteem was administered to subjects who were assigned to high and low initial esteem groups on the basis of their test scores. Equal numbers of subjects from each group were then exposed either to an experimental success manipulation designed to heighten esteem or to a failure condition designed to lower esteem. Social suggestibility was measured by a picture preference task and a verbal operant conditioning procedure.

Results obtained were as follows:

1. Subjects who experienced failure exhibited significantly more matching responses on the picture preference task than did subjects who experienced success. Matching behavior, however, was not influenced by rated self-esteem.

2. A highly significant interaction was obtained between rated and experimentally manipulated self-esteem on performance in the conditioning procedure. Subjects exposed to experiences inconsistent with their customary self-evaluations (High esteem-Failure and Low esteem-Success groups) showed significantly more verbal conditioning than did subjects whose experiences were consistent with their self-attitudes (High esteem-Success and Low esteem-Failure groups).

Overall results were generally in accord with the theory that self-esteem and persuasibility are negatively correlated.

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## *CRITIQUE AND NOTES*

# RECEPTIVITY TO SUPPORTIVE VERSUS NONSUPPORTIVE COMMUNICATIONS [1]

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Individuals whose confidence in a belief has been shaken by exposure to propaganda opposing their belief prefer to hear arguments from their own side in order to bolster their confidence. This is a conclusion reached by Brodbeck (1956) in an article reporting the effect of supportive versus contrary propaganda. Subjects who had listened to propaganda which supported or contradicted their own views on the issue of wire tapping were asked which member of a group they would most like to hear discuss the issue. Groups always consisted of four subjects who favored and four subjects who opposed wire tapping. Each subject's attitude was clearly revealed by a placard. Brodbeck found that subjects who had received contrary propaganda, and who had shifted their views in response to it, were more inclined than those who had received supportive propaganda to choose to listen to a person who shared their own initial views ($p = .07$). When both first and second choices were considered, subjects whose beliefs had been shaken by contrary propaganda continued to choose group members who shared their initial views more often than did subjects who had received supportive propaganda ($p = .06$).

Brodbeck's (1956) analysis was concerned with the *relative tendencies* of subjects who received two different experimental treatments to choose to listen to people who shared their own initial views. No tests were run to determine whether subjects who received either treatment chose people with their own beliefs more often than chance. Nevertheless, Brodbeck concluded in her summary (p. 170) that her data supported the hypothesis that individuals whose confidence has been shaken by exposure to contrary propaganda prefer to hear arguments which support their initial views. Moreover, it is suggested that people whose views have been shaken by propaganda will tend to return to their original beliefs after a free discussion because these subjects "tend to listen preferentially to persons who agree with them" (p. 170).

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Although neither of these two propositions was actually tested in Brodbeck's (1956) study, her investigation has been widely quoted as providing experimental evidence in support of one or both (Adams, 1961, p. 74; Cartwright & Zander, 1960, p. 177; Festinger & Aronson, 1960, p. 229; Stogdill, 1959, p. 111). In view of the frequency with which such references have been made, and because Brodbeck's conclusions run counter to other research findings (Festinger & Thibaut, 1951; Gerard, 1953), it seems pertinent to ask whether Brodbeck's data actually support these conclusions.

By chance alone three-sevenths (42.9%) of the subjects in Brodbeck's (1956) sample might have been expected to give their first choices to persons who shared their own views. However, only 9 of the 27 subjects (33.3%) whose views had been shaken by contrary propaganda did so. Five-sevenths (71.4%) of all such subjects should, by chance, have given their first and/or second choices to persons who shared their own views. Fifteen of the 27 critical subjects (55.6%) did so. Neither of these differences reaches the .05 level of significance; but it is clear that they tend to contradict, rather than to support, Brodbeck's conclusions. Her subjects did not indicate a preference to listen to persons who shared their own shaken views. Consequently, the data do not support the conclusion that individuals whose views have been shaken by counterpropaganda tend to revert to their original opinions after a free discussion because they "tend to listen preferentially to persons who agree with them and to ignore the arguments of their opponents" (p. 170).

Another study which is widely quoted as indicating that subjects prefer to receive supportive communications is an investigation by Mills, Aronson, and Robinson (1959). Students were asked to choose between taking an objective or an essay examination, and they subsequently indicated their preferences for articles on an annotated bibliography which dealt with the merits and faults of objective and essay examinations. There was a significant tendency for subjects to prefer articles which presented favorable infor-

mation about the type of test they had chosen. Subjects did not show a comparable preference for articles which emphasized the faults of the tests they had rejected. These findings have been supported by Rosen (1961) who replicated the study by Mills et al. However, Rosen also found that subjects preferred an article which advocated a change from their chosen to their nonchosen type of examination over an article which advocated the reverse type of change. It is difficult to reconcile this finding with the contention that people prefer to receive communications which support their own views, and Rosen has suggested that subjects may welcome either supportive or adverse information about their chosen alternative. This possibility was also noted by Mills et al. who, like Rosen, were concerned with "irrevocable" choices. It seems reasonable to hypothesize that subjects who are free to change their chosen course of action will be even more receptive to adverse information than were the subjects in the investigations conducted by Mills et al. and by Rosen.

The two studies which are most widely quoted as indicating that people are more receptive to supportive than to adverse information do not provide sufficient support for that proposition. Indeed, the Brodbeck (1956) data favor an opposite conclusion. Probably there are conditions which induce people to seek supportive information, and other conditions which create a susceptibility to adverse information. A great deal of additional research is likely to be needed before we shall be able to reach firm conclusions.

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# CONCEPT-SWITCHING IN MIDDLE-CLASS, LOWER-CLASS, AND RETARDED CHILDREN [1]

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Lewin (1936) has advanced the hypothesis that mental retardates are more rigid than normals of the same degree of differentiation, i.e., MA. This greater rigidity was viewed as an outgrowth of a lessened permeability in the boundaries between regions of the life space of retarded persons. Experimental support for this hypothesis is contained in the work of Kounin (1941), who found that retardates manifested more rigid behaviors on satiation, motoric, and concept-switching tasks than did normals of the same MA.

A second group of investigators (Shallenberger & Zigler, 1961; Stevenson & Zigler, 1957; Zigler, 1961b; Zigler, Hodgden, & Stevenson, 1958) have advanced the alternative hypothesis that the higher incidence of rigid behaviors ob-

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served in the institutionalized retarded was an outgrowth of the differential environmental treatment experienced by such persons. A prominent feature of this differential treatment is the greater social deprivation experienced by the institutionalized retarded which results in a heightened desire to initiate contact with a supportive adult and to maintain this interaction through increased effort and compliance.

The controversy stemming from these two positions was recently reviewed by Zigler (in press). He noted that while the compliance factor appears capable of explaining the greater rigidity of the retarded found by Kounin (1941) on his satiation and lever pressing tasks, it cannot easily explain Kounin's finding that retardates evidence greater difficulty than do normals in switching from one sorting principle to another, following a request to do so. (If social deprivation invariably makes for greater compliance, the social deprivation hypothesis would predict that retardates would switch at least as readily as do normals.) Zigler (1958) has suggested that while social deprivation results in greater compliance when such compliance increases the degree of social interaction, it may not lead to greater compliance when such compliance terminates this interaction. Kounin's card sorting task appears to be of this latter type. In view of this task distinction, the deprivation notion could be extended and the argument made that institutionalized retardates are thrown into a conflict between making the switch or failing to do so and thus continuing the social interaction. Since the nonsocially deprived children would experience this conflict to a much lesser degree, their performance would be superior on Kounin's task. This superiority would be enhanced further if the reward for making the switch were more highly valued by the normal than by the retarded subjects.

A close examination of Kounin's (1941) procedure on this task suggests that this might well have been the case. The only reinforcer obtained by Kounin's subjects for correctly switching concepts was whatever reinforcement inheres in being correct. Being correct is probably more reinforcing for the performance of normal than for retarded children, who may value the interaction with and attention of the experimenter much more than the satisfaction derived from performing the task correctly. The hypothesis being suggested here is that if equally effective reinforcers were dispensed to normals and retardates of the same MA for switching concepts, no differences in the ability to switch would be found. Basic to this proposal is the view that for every child there is a reinforcer hierarchy with the particular position of various reinforcers being determined by the developmental level of the child, the frequency with which the reinforcers have been paired with other reinforcers, and the degree to which the child has been deprived of these reinforcers.

Several recent studies also attest to the feasibility of attributing the differences in performance by normals and retardates on a concept-switching task to such differing reinforcer hierarchies rather than to a greater cognitive rigidity of retardates. Terrell, Durkin, and Wiesley (1959) found that middle-class children did better on a discrimination learning task when an intangible rather than a tangible reinforcer was employed, while lower-class children evidenced superior performance in a tangible as opposed to an intangible reinforcement condition. In regard to the social class variable, it was discovered that institutionalized familial retardates are predominantly drawn from the lowest segment of the lower socioeconomic class (Zigler, 1961b). Stevenson and Zigler (1957) found that the retarded are no more rigid than normal subjects on a discrimination reversal learning task when tangible reinforcers are given. Furthermore, on a concept-switching task identical to Kounin's (1941) both retarded and upper-class children switched more readily in a tangible than in an intangible reinforcement condition with neither type of subject evidencing any superiority in switching ability (Zigler & Unell, in press).

These findings suggest that the differences obtained by Kounin (1941) on his concept-switching task were due to comparing retardates with middle-class children who valued the intangible reward of being correct much more than did the retardates. Furthermore, these earlier studies suggest that not only retardates but that lower-class children in general would be inferior to middle-class children when such a reinforcer is employed. However, middle-class children should not be superior to either retarded or lower-class children of the same MA when these latter types of children are rewarded with more optimal reinforcers.

Thus, the following specific predictions were tested in this study:

1. Retarded and lower-class children will perform more effectively on a concept-switching task when a tangible rather than an intangible reinforcer is employed. Middle-class children will perform more effectively under an intangible rather than a tangible reinforcement condition.

2. In the intangible reinforcement condition middle-class children will perform more effectively than either lower-class or retarded children.

3. No difference will be found among the three

groups in their ability to switch concepts when each group receives what is for that group the assumed optimal reinforcer, i.e., the tangible reinforcer for retarded and lower-class and the intangible reinforcer for middle-class children.

## METHOD

### *Subjects*

Three groups of 22 children were used, a retarded, a lower-class, and a middle-class group, with the groups being matched on MA. The normal subjects were obtained from the Worthington Hooker and Woodward Public Schools in New Haven, Connecticut, and the retarded subjects were chosen at random from among individuals of appropriate MA and CA residing at the Southbury Training School, Southbury, Connecticut.

For the normal subjects the revised scale for rating occupation in Warner's Index of Social Characteristics (Warner, Meeker, & Eells, 1949) was used to define socioeconomic class membership. The two socioeconomic classes were defined in such a manner as to guarantee no overlap in the two distributions of occupations. That is, all the parents of children in the lower socioeconomic class received a score of either 6 or 7 on the occupation scale having such occupations as janitors, truck drivers, unskilled laborers, and semiskilled factory workers. Although the occupation of the parents of the middle-cass children ranged in scale values from 5 to 1, they were predominantly of the sort conceptualized as middle class, e.g., teachers, salesmen, accountants, small store owners.

The retardates were all of the familial type, and no individuals with gross motor or sensory disturbances were used. The Stanford-Binet, Form L, which had previously been administered by psychologists at the State School, was used to obtain the MAs of the retardates. The Goodenough Draw-A-Man Test was employed to obtain the MAs of the normal children.

### *Concept Formation Tasks*

The three concept formation tasks employed by Kounin (1941) were used in the present study. Two were pre-experimental tasks which were used to give the subjects experience with two principles of classification, a color grouping (Task I) and a form grouping (Task II). Successful performance on the pre-experimental tasks also indicated that all subjects could make the necessary form and color abstractions and discriminations. The experimental task (Task III) involved stimuli that could be grouped on the principle of either color or form.

*Task I.* Twenty-five colored rectangular cards, measuring $3.5 \times 2.5$ inches, were presented to each subject who was asked to classify them into five groupings. There were five each of the following colors: black, yellow, pink, green, and red. The instructions for this and subsequent tasks were the same as those used by Kounin (1941). These were:

> Here are some things all mixed up. Some of these are the same and belong together. Here are five boxes. Suppose you find some that are the same and belong together and put them in one of the boxes. Then find some others that are the same and put them in another box, and keep on going until you have all those that are the same together.

*Task II.* Twenty-five white cards were used. Five of each of these were of the following shapes: triangles, squares, circles, crosses, and five-pointed stars. These were presented to each subject who was again required to classify them into five groupings.

*Task III.* Twenty-five cards were used whose colors were the same as those used in Task I and whose forms were the same as those used in Task II. Again, there were five of each type of form with each of the same form cards painted a different color, i.e., a black, yellow, green, pink, and red triangle, etc. This task had two parts:

Part 1. The twenty-five cards were presented to each subject, and he was asked to classify them into five groupings.

Part 2. After the subject had classified the cards correctly, on the basis of either color or form, the experimenter reshuffled the cards, returned them to the subject, and asked him to put them together some other way.

### *Procedure*

Each subject was tested individually. Upon being taken from his classroom, the subject was told,

> We're going to play some games today, if you want to. Do you want to? You don't have to if you don't want to. Are you sure you want to?

This was the same procedure used by Kounin (1941) to guarantee a minimal motivational level. No subject approached refused to play the games. This, however, was not the case in subjects tested by Kounin.

The experimental room contained a small table and two chairs. The subject sat opposite the experimenter at the table on which there were five boxes. The subject was initially given one of the pre-experimental tasks, either Task I or Task II. After completing this task, he was given the other pre-experimental task. One-half of the subjects in each group were given Task I followed by Task II, with the other half being given Task II followed by Task I. The subjects were then given Part 1 of Task III, followed by Part 2 of Task III.

In the tangible reinforcement condition (T), when the subject was seated he was told,

> We're going to play some games in which you can win a prize. Every time you get a game right, I will give you one of these. [The subject was shown four gray pieces of cardboard 1-inch square.] When you get all four of these, you can trade them for any one of these prizes which will be yours to keep.

The subject was then shown a box containing plastic harmonicas, combs, ball-point pens, model cars, and toy watches.

Upon successfully completing Task I, Task II, and Part 1 of Task III, the subject was given a cardboard square. This token method of reinforcement is similar to that utilized by Stevenson and Zigler (1957) and was employed to keep the motivation to win a prize high as well as to avoid distracting the subject by giving him a more attractive prize after each sorting. Prior to Part 2 of Task III which requires the subject to switch concepts, the subject was told,

> See if you can win a prize by putting them together some other way.

If he did not switch on the first trial, he was told,

> You didn't win a prize that time. See if you can put them together some other way.

If the subject still did not change his method of grouping, he was instructed as follows,

> No, you can win a prize by finding some other way that they belong together.

These latter instructions were continued until the subject had a maximum of seven total trials on this part of Task III. Either a correct grouping or seven unsuccessful trials terminated the experiment for any subject. Any subject not making the switch within seven trials was arbitrarily assigned the score of eight. Following Kounin's (1941) procedure, if any subject hesitated in continuing during any of the seven trials, he was told,

> Sure you can do it. If I thought that you couldn't, I wouldn't have asked you to come up. Go ahead, I know you can find some other way to do it.

In the intangible reinforcement condition (I), no mention was made of any rewards, with the experimenter administering the instructions for each task saying, "Right," after each correct sorting. Upon completion of Part 1 of Task II, subjects in this condition were told,

> Try to put them together some other way.

If the subject did not switch concepts, he was told,

> No, see if you can put them together some other way.

If he still did not switch, he was told,

> No, find some different way. See if you can find some other way that they belong together.

These latter instructions were continued until the subject had a maximum of seven trials. The same comments used in the T condition were employed if any subject was hesitant in continuing.

All subjects were eventually given a toy for participating, but no prizes were distributed until after all subjects had been run. The three types of subjects and two reinforcement conditions resulted in the formation of six groups: Group R-I (retarded, intangible), R-T (retarded, tangible), L-I (lower class, intangible), L-T (lower class, tangible), M-I (middle class, intangible), and M-T (middle class, tangible). The mean MA, CA, IQ, and composition by sex of each group of subjects are presented in Table 1.

The experimenter recorded each subject's choice of a color or form grouping on Part 1 of Task III and the number of trials required by each subject during Part 2 of Task III to switch from one sorting principle to another.

## RESULTS

All subjects successfully completed pre-experimental Tasks I and II and Part 1 of Task III. Group comparisons of the number of subjects employing the color or form principle of Part 1 of the experimental task, the number of subjects who switched their sorting principle, and the mean number of trials required to switch are presented in Table 2.

A two-way analysis of variance (Type of Subject × Reinforcement condition) was computed on the number of trials the subject required to switch. The *F*s associated with type of subject ($F = 4.71$), reinforcement condition ($F = 4.87$), and interaction effect ($F = 3.29$) were all significant at beyond the .05 level. As can be seen in Table 2, the nature of the interaction between type of subject and reinforcement condition supports the first prediction made.

In order to test the second prediction, the performances of the three groups run under the intangible condition were compared. The resulting

TABLE 1

COMPOSITION OF THE GROUPS OF SUBJECTS

| Group | *N* | Mean MA (in years) | Mean CA (in years) | Mean IQ | *N* (Boys) | *N* (Girls) |
|---|---|---|---|---|---|---|
| Retarded-Intangible | 11 | 6.9 | 13.8 | 51 | 6 | 5 |
| Retarded-Tangible | 11 | 6.9 | 13.4 | 52 | 6 | 5 |
| Lower class-Intangible | 11 | 6.9 | 6.2 | 112 | 6 | 5 |
| Lower class-Tangible | 11 | 6.9 | 6.3 | 110 | 6 | 5 |
| Middle class-Intangible | 11 | 6.9 | 6.2 | 112 | 6 | 5 |
| Middle class-Tangible | 11 | 6.9 | 6.4 | 108 | 5 | 6 |

TABLE 2

PERFORMANCE ON EXPERIMENTAL TASK

| Group | Principle employed on Part 1 | | Number of subjects who switched sorting principle on Part 2 | Mean number of trials to switch |
|---|---|---|---|---|
| | Color | Form | | |
| Retarded-Intangible | 5 | 6 | 7 | 5.45 |
| Retarded-Tangible | 6 | 5 | 10 | 2.73 |
| Lower class-Intangible | 1 | 10 | 9 | 3.36 |
| Lower class-Tangible | 1 | 10 | 11 | 2.09 |
| Middle class-Intangible | 5 | 6 | 11 | 1.91 |
| Middle class-Tangible | 3 | 8 | 10 | 2.45 |

$F$ was highly significant ($F = 7.89$, $p < .01$). To assess the prediction further, the performance of the M-I group was compared to that of the R-I and L-I groups. These comparisons revealed that the M-I group switched more readily than did both the R-I group ($t = 4.37$, $p < .01$) and the L-I group ($t = 1.79$, $p < .05$, one-tailed test).

The third prediction was tested by comparing the performances of the R-T, L-T, and M-I groups. As predicted, no significant differences were found ($F < 1.00$). Nor were any significant differences found in a comparison of the R-T, L-T, and M-T groups ($F < 1.00$).

## DISCUSSION

In general the findings of this study supported the predictions made. In the intangible reinforcement condition, the performance of middle-class children on the concept-switching task was superior to that of both lower-class and retarded children. However, this superiority vanishes when a comparison is made of the performances of the three types of subjects, when each type is receiving its own optimal reinforcer, i.e., the intangible for middle-class and the tangible reinforcer for retarded and lower-class children. This differing effectiveness of particular reinforcers in the three types of subjects can most parsimoniously be attributed to differences in experiential histories. Several investigators (Davis, 1941, 1943, 1944; Douvan, 1956; Erickson, 1947) have noted that the emphasis on being right is primarily a middle-class phenomenon and that this particular intangible reinforcer is more frequently paired with other primary and secondary reinforcers in the middle- than it is in lower-class populations. Emphasis on being right is probably reduced even further in institutionalized retarded populations. In such children the incidence of failure is so high that training is centered around doing one's best rather than being right. The greater effectiveness of tangible reinforcers for institutionalized retarded and lower-class than for middle-class children would appear to be due to the relative deprivation of tangible rewards, such as toys, experienced by the different groups.

The finding that with proper motivation retarded children perform as effectively as normal children of the same MA on a concept-switching task is congruent with the findings of Osborn (1960), who also reported that retardates and normal children of the same MA did equally well on a concept-forming task.

This study in conjunction with earlier ones (Shallenberger & Zigler, 1961; Stevenson & Zigler, 1957; Zigler, 1961b; Zigler et al., 1958) calls into question not only the rigidity formulation of Lewin (1936) and Kounin (1941), but some more recent formulations as well. The authors have become increasingly concerned by the tendency of a number of investigators who, after finding differences in performance between normals and retardates on some task or other, immediately attribute these differences to a variety of organic or quasi-organismic factors. These factors include: primary and secondary rigidity caused by subcortical and cortical malformations, respectively (Goldstein, 1943); inadequate neural satiation related to brain modifiability or cortical conductivity (Spitz & Blackman, 1959); impaired attention directing mechanisms (Zeaman, 1959); malfunctioning disinhibitory mechanisms (Siegel & Foshee, 1960); and improper development of the verbal system resulting in a dissociation between verbal and motor systems (Luriia, 1956; O'Connor & Hermelin, 1959). These factors, though differing in kind, stem from a common view; namely, that the retarded child, in addition to his intellectual deficit, possesses extra-experiential characteristics which somehow inhere in mental retardation. Such a view stresses immutable differences between normal and retarded persons over and above that associated with the mental retardation itself.

As Sarason and Gladwin (1958) have noted, much in the way of training and treatment of

retardates has been based on this view to the detriment of those involved. Social responsibility, as well as our desire for parsimony, dictates that the situational dynamics obtaining in our experiments be carefully examined before theoretical superstructures of the type noted above are presented. Before modern-day demons are attributed to the retarded, minimal experimental rigor should be expended in controlling for such known variables as pre-institutional social deprivation experienced (Clarke & Clarke, 1954; Zigler, 1961b), institutionalization (Bolduc, 1960; Zigler, 1961a, in press), the reluctance and wariness of adults exhibited by retardates (Cruickshank, 1947; Shallenberger & Zigler, 1961), expectancy of reinforcement (Stevenson & Zigler, 1958), and the differential effectiveness of social reinforcers (Zigler et al., 1958).

## SUMMARY

Groups of retarded, lower-class, and middle-class children matched on MA were presented a concept-switching task. A tangible and an intangible reinforcement condition were employed to test the following predictions:

1. Retarded and lower-class children will perform more effectively on a concept-switching task when a tangible rather than an intangible reinforcer is employed. Middle-class children will perform more effectively under an intangible rather than a tangible reinforcement condition.

2. In the intangible reinforcement condition middle-class children will perform more effectively than either lower-class or retarded children.

3. No difference will be found among the three groups in their ability to switch concepts when each group receives what is for that group the assumed optimal reinforcer, i.e., the tangible reinforcer for retarded and lower-class and the intangible reinforcer for middle-class children.

In general, the findings supported the predictions made.

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# ANCHOR EFFECTS, SPATIAL JUDGMENTS, AND SCHIZOPHRENIA [1]

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Disruptions in the ability to make veridical judgments about physical dimensions such as time, space, and mass are recognized components of mental disease, resulting in clinical observations of *disorientation* and *loss of contact with reality*. Time judgments of schizophrenic patients are excessively influenced by contemporary stimulus anchors (Wright, 1958) and are deficient in the pooling of past experience with the contemporary context (Weinstein, Goldstone, & Boardman, 1958). Salzinger (1957) demonstrated greater anchor effects on schizophrenics with weight judgments which manifested themselves in reduced conceptual constancy. Lovinger (1956), Raush (1952), and Weckowicz, Sommer, and Hall (1958), using different methods, demonstrated reduced size constancy in various schizophrenic groups.

A study with normal subjects involving judgment of spatial units (Boardman, Aldrich, Reiner, & Goldstone, 1959) found differences due to anchor effects to be limited to a single special condition. Subjects were more accurate, less variable, and less anchor vulnerable in comparing lines with their concept of *one inch*, than in the comparison of sound with their concept of *one clock second* (Goldstone, Lhamon, & Boardman, 1957). Intersensory comparisons of temporal judgments (Goldstone, Boardman, & Lhamon, 1959) suggest no differential anchor effect due to sense mode indicating a basic conceptual difference between time and space judgments.

Schizophrenia is considered to involve "fundamental disturbances in reality relationships and concept formations . . ." (American Psychiatric Association, 1952, p. 26). The greatest differences between schizophrenics and normals should be obtained under conditions where behavior is determined by concepts or internal standards. The concept of an inch is a social standard of magnitude and is stable in a normal population. If schizophrenia involves a conceptual disorder characterized by an enhanced effect of immediate anchors upon judgment, it is probable that schizophrenics would show anchor effects upon spatial judgments when normals did not.

## METHOD

A Gunter timer and modified Type 103 viewing box were used. In the center of the presentation field was a $\frac{1}{2}$-inch horizontal slit variable in length from .01 inch to 6.00 inches, in .01-inch steps backed with a milk-glass plate, and illuminated from behind by a single white fluorescent tube. The interior of the viewing box was a uniform dull black. Exposure time was .5 second and for the remainder of the time the interior of the viewing box was dark. Retinal distance was 26 inches. A curtain concealed equipment and the experimenter, with only the viewing aperture visible to the subject.

A modified method of limits technique was used starting at one of three anchor points: .1 inch, 1.0 inch, or 2.0 inches. Ten alternating ascending and descending runs were obtained with .1-inch step intervals. Subjects were instructed to judge the line as *more* or *less* than 1-inch long. The percentage of reports of less for each length was plotted on normal probability paper and a straight line was visually fitted (Dixon & Massey, 1951). The Inch Estimation Point (IEP), or that length which the subject reported more or less than 1.0 inch equally often was derived from these plots.

Sixty acute schizophrenic patients with the following median characteristics: age 34, education 12

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TABLE 1

MEDIAN AND SEMI-INTERQUARTILE RANGE OF INCH ESTIMATION POINT (IEP) OF NORMALS, CHRONIC SCHIZOPHRENICS, AND ACUTE SCHIZOPHRENICS, UNDER ALL ANCHOR CONDITIONS

| Condition | Group I Neutral (1.0 inch) anchor | | Group II 2.0-inch anchor series first | | Group III .1-inch anchor series first | |
|---|---|---|---|---|---|---|
| | Mdn: IEP | Q: IEP | Mdn: IEP | Q: IEP | Mdn: IEP | Q: IEP |
| Normals | | | | | | |
| Initial anchor series | .89 | .17 | .94 | .32 | .87 | .14 |
| Final anchor series | x | x | .95 | .24 | 1.12 | .24 |
| *N* | 21 | | 20 | | 20 | |
| Chronic schizophrenics | | | | | | |
| Initial anchor series | 1.07 | 0.22 | 1.06 | 0.21 | 0.73 | 0.23 |
| Final anchor series | x | x | 0.87 | 0.15 | 1.02 | 0.34 |
| *N* | 20 | | 20 | | 20 | |
| Acute schizophrenics | | | | | | |
| Initial anchor series | 0.91 | 0.21 | 1.18 | 0.22 | 0.68 | 0.13 |
| Final anchor series | x | x | 1.00 | 0.20 | 0.84 | 0.16 |
| *N* | 20 | | 20 | | 20 | |

years, duration of illness 3.4 years, current hospitalization 0.2 years, were divided into three groups of 20 subjects. Group I received a series with an anchor of 1.0 inch. Group II received an initial anchor of 2.0 inches, followed after a brief rest by a series with an anchor of .1 inch. Group III received an initial anchor of .1 inch, followed by a series with an anchor of 2.0 inches. Sixty chronic schizophrenics having the following median characteristics: age 44, education 10.5 years, duration of illness 7.2 years, and current hospitalization 2.9 years, were similarly treated. Differentiation of acute and chronic schizophrenia was based on the subjects' diagnosis by a hospital staff. Sixty-one college students reported on previously (Boardman et al., 1959) with a median age of 25 and a median education of 16 years, were controls.

Each series of judgments used to derive an IEP was scored for *shifts* or *breaks*. A shift was counted where the subject's changeover point (from more or less or vice versa) showed a difference of three or more step intervals from the previous changeover point. A break was counted where the subject's changeover point was not precise, i.e., alternating more and less responses.

## RESULTS

Table 1 presents Median IEP and *Q* values for each group. The Mann-Whitney *U* test was used to determine the significance of the differences. Normal and chronic schizophrenic groups did not differ significantly when anchor conditions were identical. Normals and acute schizophrenics showed reliable differences when compared for the .1 inch initial ($p < .025$) and 2.0 inches final anchor conditions ($p < .05$). Chronic schizophrenics and acute schizophrenic subjects differed reliably for the 1.0-inch anchor condition ($p < .025$).

Table 2 summarizes the differences obtained by

TABLE 2

SUMMARY OF STATISTICAL TESTS OF THE DIFFERENCE BETWEEN EACH PART OF ANCHOR CONDITIONS WITHIN EACH SUBJECT POPULATION

| Anchor conditions compared | Probability values | | |
|---|---|---|---|
| | Normals | Chronic schizophrenics | Acute schizophrenics |
| A. 1.0 inch × initial 2.0 inches | *ns* | *ns* | .025 |
| B. 1.0 inch × initial .1 inch | *ns* | .01 | .01 |
| C. 1.0 inch × final 2.0 inches | *ns* | *ns* | *ns* |
| D. 1.0 inch × final .1 inch | *ns* | .025 | *ns* |
| E. Initial 2.0 inches × initial .1 inch | *ns* | .05 | .001 |
| F. Initial 2.0 inches × final .1 inch* | *ns* | *ns* | .05 |
| G. Initial 2.0 inches × final 2.0 inches | *ns* | *ns* | .01 |
| H. Initial .1 inch × final 2.0 inches* | .005 | .005 | .005 |
| I. Initial .1 inch × final .1 inch | *ns* | *ns* | .01 |
| J. Final .1 inch × final 2.0 inches | *ns* | *ns* | .05 |

* Indicates one-tailed Wilcoxon signed-ranks test, all others are one-tailed Mann-Whitney *U* tests.

comparing conditions *within* each population. The acute schizophrenics almost consistently showed anchoring effects: 8 of the 10 comparisons show differences. The chronic schizophrenics showed only 4 significantly different sets of anchoring conditions, and normals showed 1. A different trend was observed in the count of records containing one or more break or shift: normal 27, acute schizophrenic 41, chronic schizophrenic 63. A chi square test showed a significant difference among these proportions ($p < .01$).

The differences produced by the .1-inch followed by the 2.0-inches anchor conditions are highly significant for each of three populations (Comparison H). The reverse condition (Comparison F) showed no significant changes in the normal and chronic schizophrenic populations, and only a minimal change for the acute schizophrenic subjects. When initial anchor conditions were compared (A, B, and E), the acute schizophrenic subjects showed consistently significant differences, with Comparison E giving the most significant change obtained for any comparison. The chronic schizophrenic subjects showed two significant differences between initial anchor treatments, the normal subjects showed none.

## DISCUSSION

Schizophrenics showed greater anchor effects on their absolute judgments of linear extent than did normals. The judgments of the acute schizophrenics showed pervasive changes, while the chronic schizophrenics were effected to a much lesser extent. The effects are in the direction obtained in previous studies involving absolute temporal, spatial, and mass judgments. The concept of 1 inch, which is quite accurate and stable within a normal population, is more susceptible to contextual influences in schizophrenics. This excessive combining of immediate sensory information with established concepts to produce judgments is analogous to the clinical manifestations of disordered thinking represented by delusions. Both instances appear to involve an inability to maintain a standard for judgment based on a previously learned, reaffirmed, and consensually valid concept in the face of certain changes in the stimulus field. Here, the change was in magnitude of the judged dimension. Would changes in other stimulus dimensions prove equally effective?

While there is voluminous evidence that normals are susceptible to anchor effects under a variety of circumstances, the fact that the schizophrenics tested showed these effects to a degree or under conditions which normals did not supports and extends the findings of Wright (1958) and Salzinger (1957) that the conceptual disorders manifested by schizophrenics may arise in part from this differential vulnerability to contextual anchors.

The one set of anchor conditions which produced differences in judgments of normal subjects proved equally effective for schizophrenics, suggesting that a short anchor series followed by a long anchor series exercises the most powerful effects. Chronic schizophrenics were able to withstand anchor influences better than acute schizophrenics, leading to the conclusion that acute schizophrenia may involve the most severe disruption of conceptual and perceptual constancy.

Another aspect of conceptual disorder appears to be represented by shifts and breaks, most predominant in the chronic schizophrenics' judgments. These measures represent sudden, transitory, spontaneously reversible alterations in the subject's frame of reference or judgment standard *during* a single presentation of a stimulus series. Subjective reports indicate that at times the concept which is being used for judgment becomes "lost." The subject continues to respond, but his responses become erratic and unpredictable. This could be due either to a lost concept or to the sudden influence of irrelevant anchors resulting in a momentary alteration in the subjective scale or frame of reference. Such unpredictability is related to various clinically observed behaviors which have been assumed to be based either on some "private," autistic logic or upon a conceptual lapse. It seems more probable that shifts and breaks are due to a conceptual lapse, since irrelevant anchor effects should predominate in the group showing the greatest anchor vulnerability (i.e., the acute schizophrenics). Alterations in a subjective scale due to anchors appear as regular, predictable events with a logical but unrealistic consistency. Shifts and breaks in judgment pattern are unrealistic but also internally inconsistent and illogical.

This suggests two types of cognitive dysfunction. The first, characterized by anchor vulnerability, appears to be conceptual instability and a reduction in constancy of subjective standards —predominant in the acute schizophrenic group. The second, represented by shifts and breaks in judgment, seems to reflect conceptual deterioration or unavailability of subjective standards and occurred most frequently in the chronic schizophrenics.

## SUMMARY

A modified method of limits was used to test differential effects of anchors on absolute judgments of 1 inch by normals and acute and chronic schizophrenics. Acute schizophrenics showed the greatest anchor influences, apparently related to

a reduction in conceptual constancies. Chronic schizophrenics showed the greatest disruptions in judgment, seemingly due to a temporary conceptual lapse. Normals maintained size constancy. It was postulated that the two types of judgment error observed represented different forms of cognitive dysfunction.

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# TEST ANXIETY AND SKIN CONDUCTANCE [1]

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Berry and Martin (1957), in a study of the relationships among anxiety, instructions, sex, and galvanic skin response (GSR), report an absence of a correlation between GSR and scores on the test anxiety questionnaire (TAQ) of Mandler and Sarason (1952). Failure to obtain a relationship appears to have resulted from the use of the TAQ as an index of general anxiety level rather than as an index of task related anxiety, since the TAQ was constructed as a measure of anxiety aroused by testing situations rather than as a measure of general anxiety. Raphelson (1957) has reported data which support this contention. In a study using subjects classified on both TAQ and n Achievement he found that subjects who were high on test anxiety and low on n Achievement showed a greater change in skin conductance than subjects who were low on test anxiety and high on n Achievement during a competitive achievement task.

Recently Atkinson and Litwin (1960) have suggested that the TAQ may be profitably viewed as a measure of the strength of the motive to avoid failure and have supported this view with data showing that subjects with high TAQ scores behave in a manner consistent with theory about motive to avoid failure. They report that high TAQ subjects spend less time on a final examination and obtain lower examination grades than subjects with low TAQ scores.

The Raphelson (1957) study and the findings of Atkinson and Litwin (1960) indicate that a valid investigation of the relationship between test anxiety and skin conductance would be one in which TAQ was used to assess individual differences in motive to avoid failure and measurement of skin conductance was made in a testing situation, specifically one in which failure was induced. In this type of situation subjects with high TAQ scores would be expected to have higher skin conductance scores than subjects with low TAQ scores.

[1] This report is based in part on a dissertation submitted by the first author to the University of Buffalo in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

[2] Now at the Rochester Child Guidance Clinic.

[3] This research was supported by a grant from the Graduate School of the University of Buffalo to the second author.

## METHOD

*Subjects.* Subjects were selected from among 284 students, enrolled in introductory psychology at the University of Buffalo, to whom the TAQ had been administered at the beginning of the fall semester of 1960 as part of a group of tests. Forty-eight high scorers and 48 low scorers were selected from this group as subjects in the present study.

*Apparatus.* Palmer skin conductance was measured with an apparatus similar to one suggested by Schlosberg (1954). It consisted of a direct current meter, scaled from 0 to 100 microamperes, which was connected in series with a 3-volt battery and a subject. A 200 ohm potentiometer was used to reduce the circuit voltage to 2 volts. A 20,000 ohm precision resistor which could be switched on in place of the subject's resistance was used for calibration of the circuit. A variable resistor (800–950 ohms), which could place a shunt across the meter terminals and reduce the meter sensitivity to $\frac{1}{2}$ or $\frac{1}{4}$ for measuring high conductance levels, was also included in the apparatus. The electrodes were $\frac{1}{4}$-inch wire grids which were taped to the first and third fingers of the subject's nondominant hand. Measurements were converted into micromhos by dividing by two. The apparatus was calibrated before and after each subject was run.

Conductance levels were obtained while the subject worked on a modified form of Feather's (1960) perceptual reasoning task which consists of five line drawings which the subject must trace over without either lifting his pencil from the drawing or retracing a line. One of the five line drawing problems can be solved and four cannot be solved within these restrictions.

*Procedure.* While the electrodes were being placed on the subject it was explained to him that he was participating in an experimental investigation of physiological reactions of persons performing a task and therefore electrical recordings of his reactions would be made. When the electrodes had been attached the subject was allowed to rest for 15 minutes to permit GSR to attain a constant state. At the end of the 15-minute rest period five 1-minute readings of the subject's skin conductance were taken. These readings provided the base level and served as the control variable in an analysis of covariance.

After the five 1-minute recordings were obtained the subject was introduced to the experimental task with a solvable practice task. When the subject indicated that he understood the task and the rules under which it was to be performed he was introduced to the four unsolvable tasks with the following instructions:

> In front of you are four wells. Each well contains ten copies of a different design making a total of forty designs that you will have to complete. You will work in the following manner: Remove a design from one of the wells; you may start whenever you like. After you are ready to start working say "Ready" and I will tell you to begin work. You will have 30 seconds to complete work on a design before I tell you to stop. You will then place the design face down and take another design and say "Ready" after which I will tell you to begin. We will continue this way until all designs have been done. You will be able to work in any order that you wish.

If the subject had no question at this point the experimenter continued with the following:

> These designs are more difficult than the practice design. Remember, keep your hand [with the electrode] as still as possible and use only your other hand in performing the task. Get ready to start and I will tell you when to begin.

At this point the experimenter left the subject and retired to an observation room for the duration of the experiment. All further communications were conducted by means of an intercommunication system. Measurement of the subject's skin conductance was made at 1-minute intervals until the experiment was completed.

TABLE 1

MEAN NONADJUSTED AND ADJUSTED PALMER GSR LEVELS IN MICROMHOS FOR HIGH AND LOW TAQ GROUPS

| TAQ | *N* | Mean GSR level | |
|---|---|---|---|
| | | Nonadjusted | Adjusted |
| High | 48 | 5.69 | 5.84 |
| Low | 48 | 5.57 | 5.42 |

## RESULTS

The GSR data were analyzed using a covariance design (McNemar, 1955) to take account of individual differences in initial conductance levels. Both resting state and working state GSR scores were positively skewed and a square root transformation was applied to the data to reduce skewedness and nonnormality.

The nonadjusted and covariance adjusted mean GSR scores obtained from high and low TAQ subjects during the experimental period may be found in Table 1. It is apparent that high test anxiety is associated with higher skin conductance than low test anxiety under conditions of induced failure. The difference between the adjusted mean GSR readings of the two TAQ groups is statistically significant ($F = 8.09$, $df = 1/93$, $p < .01$—see Table 2).

TABLE 2

ANALYSIS OF COVARIANCE OF GSR SCORES OF HIGH AND LOW TAQ GROUPS

| Source | *df* | *MS* | *F* |
|---|---|---|---|
| TAQ | 1 | 3.84 | 8.09* |
| Error | 93 | .48 | |

* $p < .01$.

## DISCUSSION

The hypothesis that subjects with high TAQ scores will have higher skin conductance levels while experiencing failure than subjects with low TAQ scores was supported. When TAQ was used as an index of motive to avoid failure it was significantly related to skin conductance. This finding is interpreted as supporting the construct validity of the TAQ as a measure of motive to avoid failure. The result also lends support to the contention of Mandler and Sarason (1952) that the TAQ is a measure of anxiety which is specific to testing situations rather than a measure of general anxiety as the resting state GSR levels of the two groups did not differ significantly in an analysis of variance of these scores ($F < 1.0$). This interpretation is consistent with other studies using the TAQ (Alpert & Haber, 1960; Sarason, 1959; Sperber, 1959).

The failure of Berry and Martin (1957) to find a relationship between TAQ and GSR appears to have resulted from an inappropriate use of the TAQ as a measure of general anxiety. Their comment that absence of a relationship between TAQ and GSR conditioning "raises the question of whether any set of paper-and-pencil items is related to GSR conditioning" (p. 11), may be challenged. The present results indicate that the TAQ is appropriate for conditioning studies if subjects are in a failure situation while undergoing conditioning even though conditioning was not the focus of the present study.

## SUMMARY

Palmer GSR scores were obtained from 48 high and 48 low TAQ scoring subjects. The GSR scores were obtained while subjects worked at four unsolvable, hence failure inducing, tasks. High TAQ subjects showed significantly higher GSR levels than low TAQ subjects during the experience of failure. The conclusion of Berry and Martin (1957) that there is no relationship between TAQ and GSR was questioned on the basis of their inappropriate use of the TAQ as an indicator of general anxiety level.

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# CORTICAL INHIBITION, PERCEPTUAL SATIATION, AND INTROVERSION-EXTRAVERSION [1]

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The promise of Eysenck's concept of cortical inhibition as a major determinant of perceptual, personality, and learning phenomena (Eysenck, 1955; Eysenck, Granger, & Brengelmann, 1957) has remained largely unfulfilled in American laboratories. Rechtschaffen (1958) failed to support Eysenck's hypothesis that a relationship exists between visual figural aftereffects, reactive inhibition, and introversion-extraversion. In similar fashion, Becker (1960) reasoned that percep-

[1] This report is based on a PhD dissertation at Temple University. The author wishes to express his thanks to Horace A. Page for his thoughtful guidance as chairman of the doctoral committee.

[2] Now with the Central NP Research Laboratory, Veterans Administration Hospital, Perry Point, Maryland.

tual "satiation" measures and measures of reactive inhibition should share common factor loadings. He measured 62 male and female college students on several tests of satiation (including the spiral aftereffect, kinesthetic aftereffect, and Necker cube) and reactive inhibition (pursuit rotor reminiscence, and response alternation test). Utilizing a factor analysis of these data, he reported that "no empirical evidence was found to support Eysenck's assumption that satiation and reactive inhibition form a unitary trait" (p. 65). Further, Becker was unable to support the assumption that the introversion-extraversion dimension of personality was related to either satiation or reactive inhibition.

Verification of these earlier findings was obtained as part of a larger investigation of "neurological efficiency" (Honigfeld, 1961). A sample of 105 subjects was composed of 81 female and 24 male college students. Variables of importance for the present report were the introversion-extraversion measure and the measures of perceptual satiation. The R scale of the Guilford-Zimmerman Temperament Survey (Guilford & Zimmerman, 1949) served as the measure of introversion-extraversion. On this scale high scores refer to "restraint or seriousness" while low scores refer to "impulsiveness or rhathymia." Perceptual satiation was assessed by the average length of aftereffect of monocular viewing of a rotating Archimedes spiral, and by several indices of apparent movement, recorded under monocular, binocular, and interocular conditions. The apparent movement apparatus involved two alternating, peripheral stimuli (with no dark interval between stimuli), viewed while maintaining a central fixation. The apparent movement measures were: *beta, upper limit,* or the mean of the most rapid rates of alternation at which the perception of apparent movement was reported; *beta range,* or the average range of alternation rates over which apparent movement was reported; and *threshold for simultaneity,* or the average rate of alternation at which the subject reported both stimuli as flashing simultaneously. A canonical factor analysis (Rao, 1955) was performed on the intercorrelations obtained among all variables under study[2] (including measures

[2] The complete matrix of intercorrelations has been deposited with the American Documentation Institute. Order Document No. 7233 from ADI Auxiliary Publications Project, Photoduplication Service, Library of Congress; Washington 25, D. C., remitting in advance $1.25 for microfilm or $1.25 for photo-

TABLE 1

NAMES AND IDENTIFYING NUMBERS OF ALL VARIABLES

| Number | Variable |
|---|---|
| 1 | CFF (monocular): flicker-fusion threshold |
| 2 | CFF (binocular): flicker-fusion threshold |
| 3 | Autokinesis: extent of movement |
| 4 | Autokinesis: latency |
| 5 | SAE (monocular): length of aftereffect |
| 6 | Apparent movement (binocular): beta upper limit |
| 7 | Apparent movement (binocular): beta range |
| 8 | Apparent movement (binocular): threshold for simultaneity |
| 9 | Apparent movement (monocular): beta upper limit |
| 10 | Apparent movement (monocular): threshold for simultaneity |
| 11 | Apparent movement (interocular): beta upper limit |
| 12 | Apparent movement (interocular): beta range |
| 13 | Apparent movement (interocular): threshold for simultaneity |
| 14 | Guilford-Zimmerman: G score (general activity) |
| 15 | Guilford-Zimmerman: R score (rhathymia) |
| 16 | Guilford-Zimmerman: A score (ascendance) |
| 17 | Guilford-Zimmerman: S score (sociability) |
| 18 | Guilford-Zimmerman: E score (emotional stability) |
| 19 | Guilford-Zimmerman: O score (objectivity) |
| 20 | Guilford-Zimmerman: F score (friendliness) |
| 21 | Guilford-Zimmerman: T score (thoughtfulness) |
| 22 | Guilford-Zimmerman: P score (personal relations) |
| 23 | Scholastic Aptitude Test: verbal score |
| 24 | Scholastic Aptitude Test: quantitative score |
| 25 | Concept Mastery Test, Analogies: rights minus ½ wrongs score |
| 26 | College Qualification Test: verbal score |
| 27 | College Qualification Test: numerical score |
| 28 | College Qualification Test: scientific information score |
| 29 | College Qualification Test: social science information score |
| 30 | College Qualification Test: total score |

TABLE 2

PRODUCT-MOMENT CORRELATION OF "R" WITH ALL OTHER VARIABLES

| Variable | Correlation | Variable | Correlation |
|---|---|---|---|
| 1 | −084 | 17 | −158 |
| 2 | 011 | 18 | −063 |
| 3 | 026 | 19 | 127 |
| 4 | −011 | 20 | 265 |
| 5 | 065 | 21 | 227 |
| 6 | −074 | 22 | 148 |
| 7 | 061 | 23 | 183 |
| 8 | 059 | 24 | 091 |
| 9 | −134 | 25 | 213 |
| 10 | 013 | 26 | 127 |
| 11 | −057 | 27 | −047 |
| 12 | 053 | 28 | −081 |
| 13 | −023 | 29 | −031 |
| 14 | −308 | 30 | 051 |
| 16 | −003 | | |

Note.—Values to three places, decimal points omitted.

of intellectual ability, critical flicker frequency, and autokinetic movement). The names and identifying numbers of all variables are given in Table 1.

If Eysenck's hypothesis regarding the ubiquity of cortical inhibition were tenable for the group of subjects investigated, substantial loadings should have been obtained on common factors for the various perceptual satiation measures as well as the introversion-extraversion measure.

This hypothesis was not supported. Ten [4] factors were obtained. The factor loadings showed that rather than sharing common determinants even the perceptual measures were characterized predominantly by specific variance. Of primary importance for this report however, is the finding that the R scale failed to load on any factor other than Factor VIII, exclusively an introversion-extraversion factor. The Guilford-Zimmerman scales S and G (sociability and general activity) loaded .446 and .370 on Factor VIII, while R loaded −.403. None of the perceptual measures had substantial loadings on this factor. The most outstanding characteristic of the R scale seems to be its apparent *lack* of relationship with other variables in the matrix. Table 2 shows the low order product-moment correlations of R with all the other variables.

In the tally of reports attempting to validate Eysenck's cortical inhibition theory, this study must be counted in the negative column. It would appear that Eysenck's (1955) views regarding the generality of cortical inhibition are oversimplified, while Becker's (1960) suggestion of several different kinds of inhibitory cortical processes is a more valid representation of the complex nature of the phenomena investigated.

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[4] See Footnote 3.

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# RORSCHACH HOMOSEXUAL SIGNS IN PARANOID SCHIZOPHRENICS

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The frequency with which psychologists "disclose" homosexuality with the Rorschach (it was mentioned in a quarter of the reports on 100 run-of-the-mill clinic patients and implied in at least another quarter of them) impelled Wheeler (1949) to develop a list of Rorschach homosexual indices. Aside from its clinical promise, Wheeler's list of signs was significant to Rorschach theory because it dealt with content rather than functional aspects of percepts,

the *what* perceived rather than the *how* upon which the clinician relies so heavily, but which, to make the puzzle more enticing, has not been successful in identifying the homosexual.

There followed a number of studies which tested the validity of Wheeler's (1949) indices of homosexuality. Reitzell's (1949) homosexuals tended to score higher than did her hysterics or her alcoholics. Davids, Joelson, and McArthur (1956) found that the scale discriminated reliably between homosexual, neurotic, and normal students of eastern colleges. Italian prisoners classified as homosexual (two of them convicted of heterosexual rape!) gave more of the signs than did prisoners who had "never demonstrated" homosexual behavior (Ferracuti & Rizzo, 1956) with the difference being statistically significant by some tests but not by others. In her admirably controlled study Hooker (1958) found tendencies in the predicted direction but, for her also, different statistical tests would lead to conflicting conclusions as to the significance of the differences. Yamahiro and Griffith (1960) concluded that the signs held up well in their group of sexual deviates who were principally "well-adjusted" homosexuals. Though the power of the scale is not marked in any of the studies and the statistics usually ambiguous, taken as a body the studies must be considered as favorable toward the Wheeler indices. In Italy and in America, in college students and criminals, on East coast and West, the results are uniformly, without exception, in the positive direction. The figures from these various studies are collated with the present ones in Table 1.

Accepting Wheeler's (1949) signs as of proven validity at a time when there was less justification than today to do so Aronson (1952) employed them to test one of the most hallowed psychoanalytic tenets—of a fundamental bond between repressed homosexual impulses and delusions associated with paranoia. This famous formulation, reached by Freud through his analysis of the Schreber case and subsequently documented by many others (see Fenichel, 1945, pp. 427–436), was put to trial before Wheeler's signs by Aronson. From a large hospital population he laboriously selected 30 schizophrenic patients whose clinical pictures were dominated by one of the delusions of paranoia, principally, as it developed, by the delusion of persecution. His two control groups were of normals and of other schizophrenic patients who did not suffer the same delusions, or, if so, only mildly. His "paranoid" subjects reported "an overwhelmingly greater number of homosexual signs on the Rorschach than either non-paranoid psychotics or normals . . . [hence] the obtained results appear to be strongly supportive of the Freudian theory of paranoia" (p. 409).

However, if one examines the figures on Aronson's (1952) paranoids comparing them with those from the overt homosexuals of other studies, a rather startling fact becomes evident. His paranoids, with supposedly *latent* homosexuality, not only scored overwhelmingly higher than did his own control groups but also overwhelmingly higher than did any of the *overt* homosexual groups tested by others.

But should such an apparent contradiction really be surprising? Not if one reviews Wheeler's (1949) procedure in arriving at his scale. He validated his signs on an unselected group of patients who were undergoing psychotherapy in an outpatient clinic on the basis of the place of homosexuality in the make-up of the patient as judged by his therapist; that is, his scale was proven on the nonovert homosexual. Four of his 100 outpatients were homosexuals, 13 were judged as "suppressing" homosexuality (aware of impulses but not allowing them), and 43 were judged as "repressing" homosexuality, leaving 40 "nonhomosexuals." Thus, subsequent use rather than derivation has stamped the Wheeler list as an instrument with which to identify the overt homosexual. In using Wheeler's list Aronson (1952) was on firmer ground than others who made the inference that the same signs should apply to the overt as to the latent homosexual.

Against the body of other studies, Aronson's (1952) results bring into question the nature of Wheeler's (1949) signs. Are they more indicative of latent than of overt homosexuality and, hence, have they been misapplied in the several studies of the overt homosexual? For clinical purposes the scale would be more valuable if it detected latent homosexuality because the overt homosexual is relatively rare and not so much a diagnostic challenge. A measure of the dynamic significance of latent homosexuality in the personality structure of the patient would have considerable value in directing treatment, the function which Wheeler originally intended.

## METHOD

### *Subjects*

Records of paranoid schizophrenics, of alcoholics, and of neurotics were randomly removed from the files of a large Veterans Administration Hospital. In case the patient had been retested the original Rorschach was used; the record was discarded if the diagnosis had ever been changed either during hospitalization or upon other admissions. In addition, in the paranoid group the record was discarded if the diagnosis recommended by the psychologist did not agree with the team diagnosis.

TABLE 1

RATIO OF WHEELER SIGNS TO RORSCHACH RESPONSES

| Study | *N* | Comparison groups | | | |
|---|---|---|---|---|---|
| | | Overt homosexuals | Neuropsychiatric | Normals | Paranoids |
| Reitzell[a] (1949) (2 females) | 26 | 64/504 = .127 | | | |
| Hysterics (21 females) | 26 | | 60/744 = .081 | | |
| Alcoholics (6 females) | 26 | | 48/568 = .085 | | |
| Davids, Joelson, and McArthur (1956) | 20 | .093 (.047)[a] | | | |
| | 20 | | | .063 (.042) | |
| Neurotics | 20 | | .053 (.055) | | |
| Ferracuti and Rizzo (1956) | 20 | 47/291 = .162 | | | |
| Other prisoners | 20 | | | 14/297 = .047 | |
| Hooker (1957) | 30 | .155 (.101) | | | |
| | 30 | | | .088 (.055) | |
| Yamahiro and Griffith (1960) | 22 | .121 (.086) | | | |
| Aronson[b] (1952) | 30 | | | .049 (.054) | |
| Psychotics | 30 | | .085 (.075) | | |
| Paranoia delusional | 30 | | | | .229 (.123)[c] |
| Present (Meketon, Griffith, Taylor, and Wiedeman, 1962) | | | | | |
| Neurotics | 52 | | .088 (.072) | | |
| Alcoholics | 45 | | .100 (.083) | | |
| Paranoids | 50 | | | | .116 (.095) |
| Paranoia delusional | 42 | | | | .114 (.111)[c] |
| Unweighted average | | .132 | .082 | .062 | .153 |

[a] When available, standard deviations are given in parentheses.
[b] Reitzell's ratios are modified to exclude two signs she added to Wheeler's (1949) list. Aronson included one of her extra signs, rejected the other; the odd sign contributed a relatively small percentage of the total Wheeler responses of his paranoia group (3.8%) but, from the data he gives, it is impossible to adjust his ratios to take the reduction into account.
[c] Contains some patients with marked "paranoia" (Freud) delusions not diagnosed as paranoid schizophrenics.

Approximately 50 records were retained in each group.[1]

In order to more nearly duplicate Aronson's (1952) paranoia delusional group, members of the psychology staff were asked to nominate outstanding instances of the delusion of persecution and to rate the patient on the scale devised by Aronson (p. 403) as to the degree to which the symptom dominated the clinical picture. Only those rated "marked" or higher were collected. Some names were suggested by ward psychologists whose offices were located on the wards and who had professional and administrative duties with the patients. A few were provided by other staff psychologists from memory of patients they had known through the years. The single richest source was a psychiatrist who had served as Chief, Acute Intensive Treatment Service for 7 years and who, during a continuous span of 12 years, familiarized himself with almost every new admission to the hospital.[2] Aronson had chosen his sample from a review of 600 folders in a similar hospital; this number corresponds roughly to the patients under the purview of the ward psychologists, and the "population of patients" carried in the memories of staff members would be that figure several times over. Thus, the patients selected should have been at least as severely delusional as Aronson's. Many patients were described as classical cases: one had committed homicide because of a "wrong" done to him, "a woman in Kansas City" bewitched another and controlled his voice box, there were electrical influences felt, a mysterious "they" encroached variously upon the rights and territories of others,

[1] It was felt that little purpose would be served by matching the groups for education, intelligence, age, etc.; such variables, if paranoids should differ on them, may be considered as significant aspects of the paranoid syndrome to which the results should be generalized—that is, the interest is in the paranoid as he comes to the hospital and not in the comparatively unschooled, dull, or young paranoid as the case might be. The implications of this position go beyond the present paper.

[2] We are grateful to Charles I. Schwartz, Chief of Staff, for his assistance at a crucial point. We also express our appreciation to the ward psychologists, particularly to Robert B. Tucker who, besides helping locate patients, translated Ferracuti and Rizzo from the Italian for us.

and, of course, several had their involvements with the FBI. Forty-two qualified.

*Procedure*

All the Rorschachs were scored by a psychology trainee and a staff member. In addition they were screened by two assistants inexperienced with the Rorschach whose lists of possible signs insured against omissions. All four worked independently and, except for the delusional group which was added later, without knowledge of diagnosis. The two psychologists brought the four scorings together, passing on each of the responses; they debated the finer points and appealed in writing directly to Wheeler for rulings on issues which they could not settle between themselves.

## RESULTS AND DISCUSSION

Considerable subjective judgment does seem to be required in scoring according to Wheeler's (1949) scale (cf. Hooker, 1958, p. 36). For example, should breasts be included as genitalia? (No.) Are mouths which are mentioned as one detail among others ("nose, mouth, eyes") listed as oral details, or should they be included only when mentioned separately or when accentuated ("nose, the mouth is open, eyes")? (The latter.) One must often decide *how* confused, *how* uncertain, *how* contorted, monstrous, or threatening, *how* derogatory, etc., a percept must be before it is counted. Such problems are powerful arguments for remaining blind as to diagnosis until after scoring is completed and for independent scoring. Actual interjudge reliability in the present study cannot be reported because of feedback after small batches of records were scored; with continuing discussions and reconciliations through Wheeler, the judges moved closer and closer to being of one mind as to the signs in later records.

In order to allow for the effect of the length of the record it has become common practice to form a ratio of the Wheeler signs to the total number of responses. These ratios for the present study may be located in the bottom section of Table 1. The neurotics averaged .088 signs per Rorschach response; the alcoholics, .100; the paranoid schizophrenics, .116; and the paranoia delusionals, almost the same figure, .114. The only statistically significant comparison in the lot is between the paranoids and the neurotics which is slightly within the .05 range, and that only because the difference was in the direction predicted by the theory, hence subject to the one-tailed assumption. The most global test of the hypothesis is provided by a comparison of the two "paranoid" groups combined versus the alcoholics and neurotics combined; the resulting $t$ again is just over the .05 line of significance by the one-tailed test. Taken by themselves these results are evidence, however dubious, to support the Freudian conception of the central importance of latent homosexuality in the paranoid and/or the adequacy of the Wheeler (1949) signs to detect it. But, whatever the theoretical significance of the differences or their degree of statistical reliability, they are too slight to have any practical importance: it will be recognized that the highest ratio of .116 translates into two Wheeler signs for a Rorschach of 17 responses, while the smallest one, .088, corresponds to two signs in a 23 response record.

The results of the present study take on much of their meaning against the backdrop of other findings which have been brought together into Table 1.[3] Most relevant is Aronson's (1952),

[3] After the figures had been collated and the paper prepared, we discovered that Wheeler's (1949) scale has been scored differently than the way intended. As a safeguard against bias on his part Wheeler devised a commendable "coupon clipping" method of scoring in which he jumbled the responses from all his records. However, a close examination of his results proves that, when he tabulated the scores of each individual, he *counted each sign only once* though some of them (15 through 20) may actually appear at various places in the same record. Reitzell (1949) followed this system and Davids, Joelson, and McArthur (1956) may have, but it is certain that all the other studies, five of them including the present one, had counted all Wheeler responses however often they appeared. We decided to follow the rule of custom rather than the rule of law and leave our figures in a form comparable to the others. Comparisons with Reitzell and with Davids et al. must be made with extraordinary caution.

With their records rescored to correspond to Wheeler's procedure, our paranoids, paranoia delusionals, alcoholics, and neurotics averaged .098 (.088), .077 (.072), .082 (.063), and .073 (.062), respectively (with the *SD*s given in parentheses). The difference between the most extreme groups (paranoids and neurotics) is not satistically significant ($p$ between .05 and .06) by the $t$ test. The damage in the other studies cannot be repaired because, unfortunately, none of the reports give data in sufficient detail to allow computing the average ratio of the signs according to Wheeler (1949). In most of the studies the total sum of Wheeler signs, omitting repetitions, may be pulled out. However, the ratio of this sum to the total number of Rorschach responses for the group does not correspond to the average of the ratios for the individuals. Stated mathematically, the ratio of sums does not necessarily equal the mean sums of ratios. Or, to illustrate the same point with the economy of figures: $1/3\ (0/15 + 1/20 + 5/25)$ does not equal 6/60. Such ratios are entered at places in Table 1 (for Reitzell, 1949, and for Ferracuti & Rizzo, 1956) only because we could do no better.

The present paranoia delusional group, which was specifically chosen to duplicate his, averaged a ratio only half as high as his, .114 versus his .229. The paranoid schizophrenic group corresponded little better. At no place throughout the table is there a figure which approaches his. The lack of consistency of the Michigan and the Kentucky "paranoids" leaves open the question of whether Wheeler's (1949) scale best measures latent tendencies or overt homosexuality. However, it may be noted that none of the ratios for the 10 neuropsychiatric and normal comparison groups in the table is as large as the smallest value for the "paranoids." This finding lends some support to the presence of inordinate latent homosexuality in the paranoia syndrome, Aronson's principal hypothesis. Two cautionary notes need to be sounded as to this point: So ingrown has become the conception of the relationship between paranoid thought and homosexuality that Wheeler included in his list some signs just because of their "paranoid" significance (for example, "mask" for W on Plate I); by a clear tendency the neuropsychiatric groups (Column 2) exceed the normals (Column 3) with only Hooker's normals being out-of-pattern,[4] which is to say that high Wheeler ratios are associated with personality disorganization in general and groups selected for their marked delusional symptoms may differ from the other neuropsychiatric groups principally in the severity of the mental illness.

Turning away from the question of the relationship between paranoia and homosexuality to examine the effectiveness of the Wheeler indices in "revealing" overt homosexuality, the evidence is all favorable. Of the five homosexual groups only Davids et al. (1956) found a ratio less than any of the 10 comparison groups and only one of the 10 exceeds it. The relative smallness of the Davids et al. ratio may be due to differences in scoring (see Footnote 3) or may signal a breakdown in the ratio system. Their college homosexuals gave an unusually high number of Wheeler signs (average of 5.2), but an even more atypical number of Rorschach responses (67.9!) lowered the ratios. Giving all studies equal weight regardless of the number of subjects in the various groups and the methods of scoring, the averages for the various categories (final row of Table 1) summarizes the results so far.

[4] One must lustily second Hooker's (1957) regrets that circumstances forced her to include in the preamble to her control subjects the "purpose of the study, including the homosexual group" (p. 20). Further, she questioned them about any homosexual inclinations or experience. Though she otherwise made every effort to take the focus out of the sexual area, and feels that she succeeded in doing so (personal communication, November 1961), she may have sensitized them to it: As many of her heterosexual subjects as homosexual gave frank "genitalia" percepts, while this is one of the more discriminatory signs in other studies (cf. Davids et al., 1956, and Ferracuti & Rizzo, 1956).

## SUMMARY

Wheeler's (1949) signs, derived to detect nonovert homosexuality ("suppressed" or "repressed") but principally validated on overt homosexuals, was used to test the Freudian hypothesis of the dynamic importance of latent homosexuality in the paranoia syndrome. Hospitalized paranoid schizophrenics were compared to neurotics and alcoholics. In addition a group of records from patients whose symptomatology was dominated by delusions associated with paranoia were selected in order to more nearly replicate a previous investigation. Support of the hypothesis and the previous results was questionable. Figures reported in the literature were collated: in general widely different groups from widely separated settings have given strikingly consistent results which support the validity both of content analysis of the Rorschach and of Wheeler's indices for overt homosexuality.

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